

UNITED STATES DEPARTMENT OF COMMERCE
John E. Jones, Secretary
 WEATHER BUREAU *F. W. Reikhselder, Chief*

MONTHLY WEATHER REVIEW

JULY 1944

CONTENTS

	Page		Page
METEOROLOGICAL AND CLIMATOLOGICAL DATA:		SOLAR RADIATION AND SUNSPOT DATA:	
Astronomical Observations.....	155	Solar Radiation Observations.....	168
River Stages and Floods.....	160	Positions, Areas, and Counts of Sunspots.....	170
Climatological Data.....	161	Facsimile Relative Sunspot Numbers for April 1944..	170
		CHARTS I-XI (chart VII, snowfall, omitted until November).	





MONTHLY WEATHER REVIEW

Editor, EDGAR W. WOOLARD

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W. B. No. 1417

JULY 1944

CLOSED SEPTEMBER 5, 1944
ISSUED OCTOBER 11, 1944

METEOROLOGICAL AND CLIMATOLOGICAL DATA FOR JULY 1944

[Climate and Crop Weather Division, J. B. KINER in charge]

AEROLOGICAL OBSERVATIONS

TABLE 1.—Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by radiosondes during July 1944

STATIONS AND ELEVATIONS IN METERS ABOVE SEA LEVEL

Altitude (meters) m. s. l.	Albany, N. Y. (86 m.)				Albuquerque, N. Mex. (1,620 m.)				Apalachicola, Fla. (5 m.)				Atlanta, Ga. (300 m.)				Big Springs, Tex. (774 m.)				Bismarck, N. Dak. (505 m.)				Boise, Idaho (868 m.)			
	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity
Surface	30	1,004	20.0	83	31	839	25.3	41	31	1,016	25.3	87	31	982	24.1	73	31	926	28.6	48	31	954	20.9	65	28	914	24.6	37
500	30	957	21.1	64	31	852	21.1	64	31	960	23.7	78	31	960	23.9	63	31	902	28.1	43	31	901	19.6	56	28	900	24.9	29
1,000	30	904	18.2	63	31	852	18.2	63	31	907	21.1	71	31	906	20.9	62	31	853	24.7	44	31	850	16.2	56	28	850	22.0	25
1,500	30	852	14.5	68	31	804	14.5	68	31	856	18.0	72	31	855	17.4	66	31	805	20.8	48	31	801	12.8	56	28	802	17.7	27
2,000	30	803	10.6	73	31	758	19.9	39	31	807	15.0	70	31	806	14.0	66	31	760	16.9	54	31	754	9.5	56	28	756	13.2	32
2,500	30	756	7.2	72	31	715	15.9	43	31	716	9.1	64	31	715	7.4	70	31	716	12.8	60	31	710	6.4	56	28	712	9.1	36
3,000	30	711	4.8	60	31	634	7.5	55	31	634	3.7	58	31	633	1.8	53	31	635	5.5	55	31	628	-0.4	49	28	630	1.1	47
4,000	29	629	-0.3	44	31	561	-0.6	67	31	560	-1.7	56	30	558	-3.5	40	31	561	-1.6	53	29	554	-6.5	35	27	556	-6.7	52
5,000	29	554	-6.1	42	31	494	-7.7	72	31	493	-7.6	46	29	491	-9.3	35	31	494	-7.0	40	29	486	-13.3	34	26	488	-13.9	47
6,000	28	487	-12.5	37	30	435	-13.0	57	31	433	-14.1	48	29	431	-15.8	38	31	434	-13.4	34	29	426	-20.7	33	26	427	-21.0	44
7,000	28	426	-19.4	38	30	380	-19.5	56	31	379	-20.8	48	24	376	-23.4	45	31	379	-20.8	37	29	371	-28.5	26	26	372	-28.9	41
8,000	28	372	-26.5	42	30	331	-27.0	50	30	330	-27.9	49	24	327	-30.5	42	31	330	-28.3	44	29	321	-36.1	26	26	322	-36.6	41
9,000	26	323	-34.1	29	288	-34.8	30	287	-35.9	23	284	-37.9	23	284	-37.9	23	31	287	-36.1	45	27	278	-43.4	25	27	279	-43.5	41
10,000	26	280	-41.6	29	249	-42.7	30	247	-44.1	21	244	-45.4	21	244	-45.4	21	31	248	-44.4	26	239	-49.4	24	24	240	-49.4	41	
11,000	25	241	-48.7	29	214	-50.6	29	213	-52.3	20	210	-51.9	20	210	-51.9	20	31	213	-52.6	24	205	-53.1	23	23	206	-52.6	41	
12,000	25	206	-53.2	29	183	-57.8	28	182	-59.4	18	180	-57.7	18	180	-57.7	18	28	182	-60.0	21	175	-55.0	20	177	-54.2	41		
13,000	25	176	-55.3	23	156	-63.5	11	156	-64.4	11	153	-62.0	11	153	-62.0	11	21	155	-66.0	20	150	-66.8	16	152	-66.1	41		
14,000	23	150	-57.6	10	132	-66.8	5	133	-67.6	5	133	-67.6	5	133	-67.6	5	9	131	-69.9	16	128	-68.3	8	129	-68.4	41		
15,000	23	128	-59.2	10	110	-60.0	14	110	-60.0	14	110	-60.0	14	110	-60.0	14	14	110	-60.0	14	110	-60.0	14	110	-60.0	41		
16,000	22	110	-60.0	12	93	-57.8	9	93	-57.8	9	93	-57.8	9	93	-57.8	9	12	93	-57.8	9	93	-57.8	9	93	-57.8	41		
17,000	18	94	-58.8	9	79	-56.2	7	79	-56.2	7	79	-56.2	7	79	-56.2	7	9	79	-56.2	7	79	-56.2	7	79	-56.2	41		
18,000	16	80	-57.0	9	79	-56.2	7	79	-56.2	7	79	-56.2	7	79	-56.2	7	9	79	-56.2	7	79	-56.2	7	79	-56.2	41		
19,000	10	68	-56.0	7	68	-55.2	7	68	-55.2	7	68	-55.2	7	68	-55.2	7	7	68	-55.2	7	68	-55.2	7	68	-55.2	41		

Altitude (meters) m. s. l.	Brownsville, Tex. (6 m.)				Buffalo, N. Y. (221 m.)				Caribou, Maine (193 m.)				Charleston, S. C. ^a (14 m.)				Denver, Colo. (1,616 m.)				Dodge City, Kans. (787 m.)				El Paso, Tex. (1,195 m.)			
	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity
Surface	30	1,013	27.2	85	31	989	20.2	74	31	991	16.8	79	29	1,015	23.4	96	31	940	20.9	54	31	925	23.6	68	31	881	28.5	37
500	30	958	24.0	82	31	958	20.9	60	31	956	17.4	68	29	960	22.9	85	31	903	24.0	58	31	903	24.0	58	31	852	27.5	32
1,000	30	905	22.3	82	31	904	17.8	62	31	902	14.6	70	29	907	20.7	78	31	853	21.3	55	31	853	21.3	55	31	804	23.6	36
1,500	30	854	20.0	82	31	852	14.1	65	31	850	11.4	74	29	855	17.9	74	31	803	21.0	44	31	804	18.2	54	31	804	19.5	42
2,000	30	805	17.5	44	31	803	10.7	61	31	800	8.3	74	29	806	14.8	72	31	758	17.6	44	31	758	14.7	56	31	759	19.5	42
2,500	30	759	14.7	42	31	756	8.0	52	31	753	5.4	70	29	760	11.9	72	31	714	13.7	47	31	715	11.3	53	31	716	15.3	48
3,000	30	716	11.6	39	31	711	5.1	48	31	708	2.5	66	29	716	9.1	68	31	633	5.7	54	31	633	3.9	51	31	636	6.7	74
4,000	30	634	5.5	32	31	628	-0.6	41	31	625	-2.7	44	29	634	3.4	62	31	560	-2.2	65	31	559	-3.0	47	31	562	-0.6	73
5,000	30	561	-0.5	32	31	554	-6.4	34	31	551	-8.7	44	27	560	-1.8	57	31	493	-9.8	72	31	492	-9.1	39	31	495	-6.8	66
6,000	30	494	-6.6	33	31	486	-12.9	36	31	483	-15.1	45	27	493	-7.5	52	31	433	-16.4	50	30	432	-15.2	34	31	435	-12.6	40
7,000	30	434	-13.1	32	31	426	-19.7	39	31	423	-22.3	47	27	433	-14.1	49	31	378	-23.5	40	30	377	-22.2	38	31	381	-19.4	35
8,000	29	380	-20.3	31	371	-27.0	38	31	368	-29.8	48	27	379	-20.9	44	31	329	-30.5	34	30	328	-29.7	30	328	-26.9	34		
9,000	29	330	-27.7	30	322	-34.6	30	31	319	-37.2	25	330	-28.1	42	30	329	-30.5	34	30	328	-29.7	30	328	-26.9	34			
10,000	29	287	-35.5	30	278	-42.3	30	31	276	-44.3	24	286	-35.7	36	29	285	-38.0	38	29	285	-37.6	30	285	-34.6	34			
11,000	29	248	-43.5	29	240	-49.6	29	31	237	-50.0	21	248	-43.4	29	246	-45.4	29	246	-45.4	29	246	-45.2	29	246	-42.8	41		
12,000	29	213	-51.5	29	205	-54.2	29	31	203	-52.9	21	213	-51.1	24	211	-51.7	27	212	-52.2	27	212	-52.2	27	212	-51.2	41		
13,000	29	183	-58.8	28	176	-55.9	30	174	-54.5	17	182	-56.9	19	181	-57.7	19	181	-57.7	19	181	-57.7	19	181	-57.7	19	181	-57.7	41
14,000	24	155	-65.0	22	150	-57.7	23	148	-54.5	14	156	-62.4	17	154	-62.9	17	154	-62.9	17	154	-62.9	17	154	-62.9	17	154	-62.9	41
15,000	13	132	-69.1	16	128	-60.0	16	127	-55.8	9	132	-66.5	14	130	-65.8	14	130	-65.8	14	130	-65.8	14	130	-65.8	14	130	-65.8	41
16,000	5	112	-71.6	6	109	-59.8	8	108	-54.9	5	113	-68.8	5	111	-68.2	5	111	-68.2	5	111	-68.2	5	111	-68.2	5	111	-68.2	41
17,000	5	112	-71.6	6	109	-59.8	8	108	-54.9	5	113	-68.8	5	111	-68.2	5	111	-68.2	5	111	-68.2	5	111	-68.2	5	111	-68.2	41

See footnotes at end of table.

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TABLE 1.—Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in per cent, obtained by radiosondes during July 1944—Continued

STATIONS AND ELEVATIONS IN METERS ABOVE SEA LEVEL

Altitude (meters) m. s. l.	Fly, Nev. ³ (1,908 m.)				Glasgow, Mont. (648 m.)				Great Falls, Mont. (1,128 m.)				Greensboro, N. C. (273 m.)				Hatteras, N. C. (3 m.)				Huntington, W. Va. (172 m.)				International Falls, Minn. (343 m.)			
	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity
Surface.....	31	809	21.0	21	31	938	21.8	52	31	887	20.6	42	31	986	21.7	83	31	1017	24.6	82	31	996	21.1	76	31	972	18.1	77
500.....	31	801	22.6	21	31	900	20.3	43	31	801	15.2	41	31	907	19.3	72	31	961	21.6	78	31	959	23.6	55	31	954	18.9	69
1,000.....	31	786	20.7	20	31	849	16.5	48	31	754	11.1	61	31	855	15.9	68	31	856	16.3	55	31	854	16.5	60	31	849	12.6	72
1,500.....	31	715	16.3	20	31	709	8.4	55	31	710	6.8	54	30	759	9.0	66	31	807	13.6	49	31	805	12.5	68	31	799	9.6	67
2,000.....	31	633	7.4	21	31	627	-2.2	54	31	628	-1.6	63	30	632	0.5	55	31	633	2.2	45	30	631	0.5	49	31	625	-1.7	43
2,500.....	31	559	-1.9	23	31	552	-8.5	42	31	553	-8.1	44	29	558	-5.2	47	31	559	-3.3	38	29	557	-4.8	40	31	550	-8.2	37
3,000.....	31	492	-11.1	25	31	484	-15.1	40	31	485	-15.0	37	29	490	-11.5	48	30	492	-9.3	39	29	489	-10.8	31	31	483	-14.6	36
3,500.....	30	432	-18.4	26	31	423	-22.3	39	31	425	-22.2	41	29	430	-17.6	44	29	432	-15.5	43	28	429	-17.3	31	31	423	-21.7	38
4,000.....	30	376	-25.9	25	31	368	-29.9	31	31	370	-30.0	41	29	375	-24.7	40	27	377	-22.1	48	28	375	-24.5	31	31	368	-29.0	31
4,500.....	30	327	-33.4	24	29	319	-37.9	31	31	320	-37.7	31	29	326	-32.3	37	26	327	-29.4	56	28	326	-31.6	30	31	319	-36.5	31
5,000.....	29	283	-40.6	29	29	276	-45.4	31	31	277	-45.1	31	28	282	-40.6	31	24	284	-37.2	31	28	282	-39.0	30	30	276	-43.5	31
5,500.....	29	244	-47.3	29	29	237	-51.0	30	30	238	-51.4	28	28	243	-48.2	26	24	246	-45.0	31	28	244	-46.1	28	28	238	-49.5	31
6,000.....	29	209	-53.3	28	28	203	-53.2	26	26	204	-54.0	25	25	209	-55.5	25	24	211	-52.8	31	28	209	-52.4	26	26	203	-52.8	31
6,500.....	26	178	-58.4	26	26	174	-53.7	20	20	175	-54.5	25	25	178	-61.4	20	20	181	-59.4	31	28	178	-57.2	18	18	174	-53.5	31
7,000.....	20	152	-63.8	24	24	149	-54.8	14	14	150	-55.0	19	19	151	-65.0	13	13	154	-64.6	31	22	153	-60.0	14	14	149	-54.6	31
7,500.....	12	129	-68.3	19	19	127	-56.2	7	7	127	-55.9	12	12	128	-66.2	9	9	131	-66.2	31	15	130	-62.6	9	9	128	-57.0	31
8,000.....	5	109	-69.3	14	14	109	-57.1	5	5	109	-56.7	5	5	109	-67.7	10	10	111	-64.0	31	10	111	-64.0	5	5	109	-55.5	31
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Altitude (meters) m. s. l.	Jackson, Miss. (97 m.)				Joliet, Ill. (178 m.)				Lake Charles, La. (5 m.)				Lakehurst, N. J. ¹ (39 m.)				Little Rock, Ark. (79 m.)				Louisville, Ky. (166 m.)				Mazatlan, Mexico (80 m.)			
	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity
Surface.....	28	1,003	25.9	77	31	994	20.5	73	31	1,014	26.1	85	29	1,012	22.4	77	30	1,005	26.8	63	31	996	24.1	64	34	1,004	28.7	76
500.....	28	959	25.4	68	31	958	22.4	56	31	959	25.0	67	29	960	22.5	58	30	958	26.6	52	31	958	25.2	49	34	958	25.4	68
1,000.....	28	906	22.5	64	31	904	19.2	53	31	906	22.3	64	29	906	19.7	56	30	906	23.0	50	31	906	21.5	53	34	905	23.7	65
1,500.....	28	855	19.4	64	31	853	15.2	63	31	856	19.6	55	29	855	16.2	59	30	855	19.4	53	31	855	17.2	60	24	854	20.7	73
2,000.....	28	806	16.1	66	31	804	11.7	63	31	807	16.7	52	29	806	12.5	61	30	806	15.7	56	31	806	13.1	67	24	806	18.3	70
2,500.....	27	760	12.8	62	31	757	9.1	60	31	760	13.6	47	29	759	9.2	53	30	760	12.3	57	31	758	9.8	62	24	760	16.0	60
3,000.....	27	716	9.8	54	31	712	6.3	44	31	716	10.6	46	29	714	6.3	45	30	716	9.0	51	31	714	6.8	53	24	717	13.4	55
3,500.....	27	634	3.8	42	31	630	1.2	36	31	635	4.6	46	29	632	0.9	35	30	634	3.3	37	31	632	0.8	42	22	636	6.5	61
4,000.....	27	560	-1.0	37	29	556	-5.3	30	30	561	-1.1	44	29	557	-4.8	35	29	559	-2.5	34	31	557	-4.8	34	16	562	-0.2	62
4,500.....	27	493	-7.4	34	28	488	-11.5	26	31	494	-6.4	31	29	490	-10.8	29	29	492	-8.3	35	31	490	-10.3	26	16	496	-6.5	55
5,000.....	26	434	-13.5	35	28	427	-18.6	23	30	434	-13.1	35	29	430	-17.7	29	29	432	-14.7	34	30	430	-17.1	31	16	436	-12.4	44
5,500.....	26	379	-20.6	35	28	373	-26.0	20	30	380	-20.2	36	27	375	-23.9	30	29	378	-21.6	31	30	375	-24.3	38	13	381	-19.2	50
6,000.....	25	330	-28.0	35	28	324	-33.4	16	30	331	-27.5	36	27	326	-31.0	30	29	329	-28.5	31	30	326	-31.5	13	333	-26.3	31	
6,500.....	25	287	-35.7	35	28	281	-40.8	10	30	288	-35.1	36	27	283	-38.5	29	29	286	-36.0	31	30	283	-38.8	11	289	-33.7	54	
7,000.....	25	248	-44.0	35	28	242	-47.9	9	29	248	-43.1	36	26	244	-45.6	29	29	247	-43.9	31	30	244	-46.0	10	250	-41.4	44	
7,500.....	24	213	-51.5	35	28	205	-52.9	9	29	214	-51.1	36	26	210	-51.8	29	29	212	-51.4	31	30	209	-52.4	10	216	-49.2	31	
8,000.....	23	182	-58.4	35	25	177	-56.0	24	24	183	-58.7	36	19	181	-56.5	29	28	181	-57.8	31	29	179	-57.9	8	185	-57.2	42	
8,500.....	21	155	-64.4	34	18	152	-69.5	23	23	156	-65.1	38	8	154	-60.8	25	25	155	-63.2	31	19	152	-61.3	6	157	-64.0	42	
9,000.....	11	132	-68.8	15	15	129	-61.7	15	15	132	-69.6	38	6	130	-64.1	19	19	132	-67.4	31	11	129	-62.2	5	134	-69.2	31	
9,500.....				11	11	110	-60.7	5	5	112	-70.4	38				16	16	111	-69.7	31	6	110	-62.0					
10,000.....				5	5	93	-59.4																					
10,500.....																												
11,000.....																												
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12,500.....																												

See footnotes at end of table.

TABLE 1.—Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by radiosondes during July 1944—Continued

STATIONS AND ELEVATIONS IN METERS ABOVE SEA LEVEL—Continued

Altitude (meters) m. s. l.	Omaha, Nebr. (301 m.)				Phoenix, Ariz. (339 m.)				Pittsburgh, Pa. (392 m.)				Portland, Maine ¹ (20 m.)				Rapid City, S. Dak. (981 m.)				St. Louis, Mo. (171 m.)				St. Paul, Minn. (225 m.)			
	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity
Surface.....	31	979	24.4	69	31	969	32.9	29	31	970	22.0	65	31	1,012	17.5	90	31	904	19.6	65	31	995	24.5	62	31	987	21.5	70
500.....	31	957	23.8	63	31	952	34.9	18	31	958	22.2	50	31	958	18.8	73	31	895	24.6	49	31	958	24.6	49	31	956	20.5	64
1,000.....	31	904	21.4	59	31	900	31.4	19	31	905	20.0	53	31	903	16.6	69	31	902	19.8	63	31	905	21.0	51	31	902	17.0	66
1,500.....	31	853	18.0	61	31	852	27.2	21	31	854	16.2	56	31	852	13.5	70	31	852	19.1	47	31	854	17.4	53	31	850	14.0	64
2,000.....	31	804	15.1	57	31	804	22.9	25	31	804	12.3	61	31	802	10.0	70	31	803	15.6	50	31	805	14.3	49	31	801	11.4	61
2,500.....	31	758	12.2	50	31	758	18.4	31	31	758	8.5	62	31	755	6.9	70	31	756	12.4	53	31	758	11.2	50	31	754	8.7	52
3,000.....	31	714	8.9	44	31	716	14.2	37	31	713	5.7	50	31	710	4.2	67	31	713	9.1	50	31	714	8.4	44	31	710	5.8	48
4,000.....	30	632	2.2	47	31	635	6.1	46	31	630	0.5	40	31	628	-1.0	58	31	630	1.5	52	31	632	2.3	41	31	628	-0.4	41
5,000.....	29	558	-4.0	33	31	561	-0.5	47	31	556	-5.2	40	30	553	-7.0	52	31	556	-5.8	51	31	558	-3.3	39	31	553	-6.4	35
6,000.....	29	491	-10.7	30	31	494	-7.1	45	31	488	-11.2	36	28	486	-12.8	49	31	489	-12.4	44	30	491	-9.6	28	31	486	-12.0	37
7,000.....	29	430	-17.3	---	31	434	-13.3	41	31	428	-18.0	38	27	426	-19.7	47	31	428	-19.3	44	29	431	-16.6	33	31	426	-19.7	40
8,000.....	29	375	-24.0	---	31	380	-20.4	38	30	374	-25.0	39	27	371	-26.2	46	31	373	-26.6	46	29	376	-23.7	33	31	371	-27.3	41
9,000.....	29	326	-31.0	---	31	331	-27.9	35	30	324	-32.4	45	25	322	-33.3	46	29	324	-33.8	---	29	327	-31.4	36	31	322	-34.5	---
10,000.....	29	283	-38.4	---	31	288	-35.7	---	30	282	-40.1	---	25	279	-40.4	---	28	281	-41.6	---	29	284	-39.1	---	31	279	-42.1	---
11,000.....	29	244	-45.5	---	31	248	-43.6	---	30	242	-47.5	---	25	240	-47.2	---	28	242	-48.6	---	29	245	-46.3	---	31	240	-48.5	---
12,000.....	28	210	-52.0	---	31	214	-51.1	---	30	208	-53.1	---	23	206	-53.2	---	24	207	-53.8	---	28	210	-52.9	---	31	206	-52.7	---
13,000.....	24	180	-57.3	---	31	183	-57.7	---	29	178	-56.8	---	21	176	-56.2	---	21	177	-56.6	---	27	179	-58.3	---	28	176	-55.6	---
14,000.....	20	153	-61.3	---	30	156	-63.0	---	26	152	-59.6	---	19	151	-56.6	---	14	151	-58.8	---	26	153	-62.6	---	22	150	-58.5	---
15,000.....	17	130	-62.9	---	16	133	-67.3	---	19	129	-60.4	---	18	129	-57.8	---	11	128	-61.1	---	25	130	-65.1	---	14	128	-59.9	---
16,000.....	14	111	-63.4	---	9	112	-70.2	---	16	110	-61.0	---	16	110	-59.0	---	5	109	-60.9	---	12	111	-66.3	---	5	109	-60.9	---
17,000.....	8	95	-60.1	---	---	---	---	---	10	93	-58.3	---	12	94	-57.2	---	---	---	---	---	7	94	-63.8	---	---	---	---	---
18,000.....	---	---	---	---	---	---	---	---	5	80	-56.3	---	7	68	-55.1	---	---	---	---	---	---	---	---	---	---	---	---	---
19,000.....	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Altitude (meters) M. S. L.	San Antonio, Tex. (240 m.)				San Diego, Calif. ¹ (19 m.)				San Juan, P. R. (15 m.)				Santa Maria, Calif. (71 m.)				S. Ste. Marie, Mich. ¹ (221 m.)				Seattle, Wash. ¹ (22 m.)				Spokane, Wash. (598 m.)			
	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity	Number of ob- servations	Pressure	Temperature	Relative hu- midity
Surface.....	34	985	29.2	60	25	1,012	17.6	81	29	1,015	26.3	85	31	1,007	14.4	85	31	988	15.7	86	30	1,014	22.1	59	31	944	25.9	29
500.....	31	957	27.5	62	25	957	15.9	75	29	961	23.1	85	31	958	13.6	85	31	956	17.2	72	30	959	18.3	59	31	901	22.9	26
1,000.....	31	905	24.4	65	25	903	21.3	27	29	908	20.0	82	31	903	20.5	80	31	902	15.7	66	30	905	15.0	60	31	901	15.3	29
1,500.....	31	855	20.9	65	25	852	20.8	16	29	857	17.2	77	31	852	10.7	22	31	850	13.2	66	30	853	12.2	58	31	851	18.3	34
2,000.....	31	806	17.7	58	25	804	19.1	---	29	807	15.0	59	31	803	16.8	25	31	801	10.2	67	30	803	9.4	56	31	802	13.8	42
2,500.....	31	760	14.7	49	24	758	16.6	---	29	761	12.5	50	31	757	13.4	23	31	753	7.5	65	30	756	6.6	53	31	755	9.3	50
3,000.....	31	716	12.0	49	24	714	13.7	---	29	717	9.5	44	31	713	10.3	17	31	709	4.9	62	30	711	3.8	48	31	711	6.0	56
4,000.....	31	635	5.8	41	24	634	6.5	---	29	635	3.5	42	31	632	4.1	---	30	627	-0.3	56	30	628	-2.1	43	31	628	-2.0	48
5,000.....	31	561	-0.4	40	24	560	0.0	---	29	561	-2.3	48	31	558	-2.5	---	28	553	-6.1	49	30	553	-8.3	40	31	553	-6.4	32
6,000.....	31	494	-5.9	31	24	493	-6.5	---	29	494	-7.4	42	31	491	-9.6	---	26	486	-12.8	45	30	485	-15.1	36	30	485	-15.1	31
7,000.....	31	435	-12.5	30	22	434	-13.6	---	29	434	-13.7	41	31	430	-7.5	---	26	426	-19.7	41	30	425	-22.6	40	30	425	-22.3	---
8,000.....	30	381	-19.6	32	21	379	-21.2	---	28	379	-20.4	---	31	376	-25.1	---	26	371	-27.3	40	30	369	-30.4	---	29	370	-29.8	---
9,000.....	30	331	-27.0	---	21	330	-28.5	---	26	330	-28.0	---	31	326	-32.7	---	26	322	-34.7	39	30	320	-38.3	---	29	320	-37.2	---
10,000.....	29	288	-34.4	---	20	287	-35.8	---	25	286	-36.0	---	31	283	-39.6	---	25	278	-42.3	46	30	276	-45.6	---	29	277	-44.2	---
11,000.....	29	250	-42.3	---	20	248	-43.3	---	23	248	-44.4	---	31	244	-46.3	---	24	240	-48.9	---	30	238	-50.4	---	28	238	-49.4	---
12,000.....	29	215	-50.2	---	13	213	-49.5	---	23	213	-52.6	---	29	209	-51.9	---	22	206	-52.3	---	30	203	-54.0	---	28	204	-52.7	---
13,000.....	28	184	-57.0	---	10	182	-55.7	---	17	181	-60.6	---	25	179	-56.3	---	18	176	-54.0	---	30	174	-55.4	---	25	175	-53.6	---
14,000.....	24	167	-62.8	---	9	155	-60.6	---	8	154	-65.6	---	22	153	-60.9	---	14	151	-54.4	---	28	148	-54.9	---	19	150	-53.9	---
15,000.....	11	134	-68.4	---	8	132	-63.8	---	---	---	---	---	14	130	-63.2	---	11	128	-56.1	---	24	127	-54.8	---	14	128	-55.2	---
16,000.....	---	---	---	---	8	112	-66.1	---	---	---	---	---	6	111	-63.8	---	9	110	-56.7	---	17	109	-55.1	---	11	110	-56.1	---
17,000.....	---	---	---	---	---	---	---	---	---	---																		

TABLE 2.—Free-air resultant winds based on pilot-balloon observations made near 5 p. m. (75th meridian time) during July 1944. Directions given in degrees from north (N=560°, E=90°, S=180°, W=270°). Velocities in meters per second—Continued

Altitude (meters) m. s. l.	Oakland, Calif. (8 m.)			Oklahoma City, Okla. (402 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Louis, Mo. (181 m.)			St. Paul, Minn. (235 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (15 m.)			Sault Ste. Marie, Mich. (230 m.)			Seattle, Wash. (12 m.)			Spokane, Wash. (603 m.)			Washington, D. C. (24 m.)				
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity					
Surface.....	31	273	5.6	31	164	4.1	31	171	1.7	31	297	1.2	31	45	1.5	31	264	1.5	31	220	2.3	31	140	4.4	31	261	4.3	30	259	3.9	31	290	2.6	31	224	2.7	30	156	2.9		
500.....	29	269	3.6	31	164	4.3	31	173	2.3	31	287	1.7	31	40	1.4	31	270	1.3	31	233	2.9	31	141	4.4	31	295	1.8	30	265	5.4	31	275	0.6	30	185	3.1					
1,000.....	25	246	2.0	31	172	4.4	31	208	2.9	31	258	2.0	31	40	1.4	31	284	2.0	31	240	4.1	31	137	5.0	31	236	0.9	29	267	6.5	28	281	0.4	31	233	2.9	29	215	3.2		
1,500.....	25	263	1.6	30	180	4.0	29	217	2.7	31	235	2.4	31	329	1.1	31	291	2.7	31	248	5.1	31	140	5.1	30	244	1.5	28	264	7.2	24	313	1.0	31	241	3.1	29	238	3.2		
2,000.....	24	311	0.9	27	200	3.8	22	238	3.2	31	224	3.2	31	291	2.2	31	279	4.4	25	256	6.0	31	146	4.3	29	224	2.5	25	275	7.7	21	309	1.8	30	248	4.2	24	265	4.1		
2,500.....	23	168	0.8	26	226	3.8	17	273	5.1	31	222	3.8	28	280	3.9	29	293	5.9	18	260	6.2	30	154	3.8	29	215	4.4	22	274	7.4	19	281	1.3	30	251	4.6	23	273	5.1		
3,000.....	23	153	1.5	24	236	4.6	16	287	7.5	31	216	3.5	27	278	5.9	28	297	6.6	14	263	7.6	26	174	3.9	28	217	5.8	20	287	7.6	18	268	1.8	28	255	4.5	23	271	5.4		
4,000.....	23	190	1.4	16	263	6.5	13	293	8.3	31	106	4.2	25	279	10.4	23	303	7.7	24	160	2.2	27	212	6.4	15	302	8.7	15	265	2.4	22	256	5.3	20	282	4.9					
5,000.....	23	181	1.5	12	288	7.6	10	301	9.3	29	205	3.9	23	284	13.0	20	310	8.1	23	255	0.3	27	209	6.6	14	304	10.5	14	281	2.9	17	275	5.6	16	274	5.5					
6,000.....	23	214	3.0	.....	.....	.....	10	304	10.0	28	210	5.3	17	279	15.8	19	300	9.1	23	294	0.6	27	218	6.5	13	297	11.9	11	314	5.5	13	272	6.5	15	266	4.7			
8,000.....	20	226	6.0	25	212	8.6	11	279	20.9	16	293	12.5	
10,000.....	19	223	9.4	21	219	13.8	
12,000.....	17	234	16.8	19	231	15.7	
14,000.....	13	239	17.3	17	239	12.2	
16,000.....	13	218	6.5

TABLE 3.—Maximum free-air wind velocities (m. p. s.) for different sections of the United States based on pilot-balloon observations during July 1944

Section	Surface to 2,500 meters (m. s. l.)					Above 2,500 to 5,000 meters (m. s. l.)					Above 5,000 meters (m. s. l.)				
	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station
Northeast ¹	32.2	SW.	437	12	Nantucket, Mass.....	34.0	W.	4,050	26	North Truro, Mass.....	54.0	WSW.	10,135	13	Portland, Maine.
East-Central ²	28.8	WSW.	1,734	12	Washington, D. C.....	29.0	SW.	4,597	29	Hatteras, N. C.....	46.4	W.	11,897	4	Hatteras, N. C.
Southeast ³	25.6	WNW.	2,088	28	Birmingham, Ala.....	24.9	W.	2,628	28	Birmingham, Ala.....	36.0	WNW.	10,908	21	Birmingham, Ala.
North-Central ⁴	38.8	WSW.	2,094	28	Detroit, Mich.....	33.2	ESE.	4,423	3	Muskegon, Mich.....	45.4	N.	13,418	1	International Falls, Minn.
Central ⁵	29.5	SW.	1,242	26	Indianapolis, Ind.....	33.4	W.	3,269	10	Des Moines, Iowa.....	44.3	NW.	11,140	30	Wichita, Kans.
South-Central ⁶	29.5	SSE.	1,903	30	Amarillo, Tex.....	34.0	WNW.	4,318	28	Little Rock, Ark.....	46.4	WNW.	11,093	21	Little Rock, Ark.
Northwest ⁷	30.4	WNW.	2,421	5	Ellensburg, Wash.....	30.4	WSW.	3,197	24	Havre, Mont.....	65.0	WSW.	7,918	2	Great Falls, Mont.
West-Central ⁸	29.0	SSW.	2,500	4	Ely, Nev.....	31.8	SW.	4,340	1	Ely, Nev.....	65.0	WSW.	9,484	27	Salt Lake City, Utah.
Southwest ⁹	30.8	SW.	2,106	4	Mt. Laguna, Calif.....	26.2	W.	3,208	24	El Paso, Tex.....	47.6	SW.	10,107	26	Sandberg, Calif.

¹ Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, and northern Ohio.² Delaware, Maryland, Virginia, West Virginia, southern Ohio, Kentucky, eastern Tennessee, and North Carolina.³ South Carolina, Georgia, Florida, and Alabama.⁴ Michigan, Wisconsin, Minnesota, North Dakota, and South Dakota.⁵ Indiana, Illinois, Iowa, Nebraska, Kansas, and Missouri.⁶ Mississippi, Arkansas, Louisiana, Oklahoma, Texas (except El Paso), and western Tennessee.⁷ Montana, Idaho, Washington, and Oregon.⁸ Wyoming, Colorado, Utah, northern Nevada, and northern California.⁹ Southern California, southern Nevada, Arizona, New Mexico, and extreme west Texas.

RIVER STAGES AND FLOODS

By BENNETT SWENSON

THE principal features of the month were the continuation and increase of drought conditions over most of the country east of the Mississippi River, especially in the central Gulf States, the Ohio Valley and the Middle Atlantic States, and continued above-normal precipitation in Iowa and Minnesota and most of the Missouri and Arkansas Valleys.

River stages were unusually low over most of the East, the South, and the far Northwest except that light flooding occurred in the eastern Carolinas. In the Missouri and Upper Mississippi Valleys stages were well above normal but damaging flood conditions were generally avoided due to the distribution of the rainfall, except in some local areas where excessive concentrations resulted in destructive floods.

Hudson Bay drainage.—The Red River of the North rose to 18.7 feet on July 10 at Moorhead, Minn., 1.7 feet above flood stage. The rise resulted from heavy thunder-showers in the upper basin. Wahpeton, N. Dak., reported 4 inches on July 3 and similar amounts were reported from Fergus Falls, Minn., and White Rock, S. Dak. Two days later, showery conditions again occurred with amounts somewhat above 1 inch. Only slight damage resulted from this rise which followed a 20-foot crest during the previous month.

Atlantic Slope Drainage.—River stages were generally low throughout the month except in the streams in the Carolinas. Flooding occurred only in the Cape Fear River with light overflows recorded at Fayetteville and Elizabethtown, N. C., on July 17-20. Excessive showers occurred over the Cape Fear, Neuse, and upper Tar Rivers on July 14; however, the soil had been extremely dry and resulting run-off was low.

Upper Mississippi Basin.—Stream flow was considerably above normal in the basin and flood stages continued from the previous month along the Mississippi River from Gordons Ferry, Iowa, to Grafton, Ill., during the first part of July. Thereafter a general recession of water levels took place.

Missouri Basin.—Unusually intense local rains resulted in damaging overflows in Perry Creek at Sioux City, Iowa, and Sappa and Prairie Dog Creeks, in the upper Republican River Basin. Otherwise, light floods occurred in the Big Sioux and Floyd Rivers in Iowa, and the Solomon, Blue, and Republican Rivers in Kansas and Nebraska. Stages in the Missouri River between Blair, Nebr., and Waverly, Mo., receded from flooding which was in progress during June.

On the night of July 6-7, excessively heavy rains occurred over the lower Floyd River and the Perry Creek watersheds. The Perry Creek overflow caused the greatest damage, confined entirely within the city limits of Sioux City, Iowa. A large section of the city comprising 1,000 acres was flooded and 1,133 residences and 350 business properties were affected. The heaviest rain was concentrated over a very small area as is seen from the following amounts of recorded precipitation: City Airport, 1.18 inches; North Sioux City, 4.80 inches;

James, Iowa (5 miles northeast of Sioux City), 6.98 inches; and Merrill, Iowa (12 miles north of James), 1.82 inches. Flood waters of the Floyd River surrounded James and caused some damage in the northeast part of Sioux City.

On July 16, more than 5 inches of rain at Oberlin, Kans., caused Sappa and Prairie Dog Creeks to overflow seriously. Sappa Creek reached a record stage of 18.7 on the gage near Beaver City, Nebr., 7.7 feet above bankful.

Arkansas Basin.—Flooding, mostly light, was confined to the Little Arkansas River at Sedgwick, Kans., and the North Canadian River at Yukon, Okla. The overflow in the Little Arkansas resulted from heavy rains of 2 to 3 inches on July 9, followed by rainfall of nearly 3 inches on July 11. A crest of 23.6 feet was reached at Sedgwick on the 11th.

The North Canadian River rose to 11.2 feet, 0.2 foot above flood stage, on July 29 at Yukon, Okla.

FLOOD-STAGE REPORT FOR JULY 1944

[All dates in July unless otherwise specified]

River and station	Flood stage	Above flood stages— dates		Crest ¹	
		From—	To—	Stage	Date
HUDSON BAY DRAINAGE					
Red of North: Moorhead, Minn....	Feet 17	7	13	Feet 18.7	10
ATLANTIC SLOPE DRAINAGE					
Cape Fear:					
Fayetteville, N. O.	35	17	17	35.0	17
Elizabethtown, N. C.	20	17	20	27.3	18
MISSISSIPPI SYSTEM					
Upper Mississippi Basin					
Mississippi:					
Burlington, Iowa.....	15	June 21	4	16.6	June 30
Keokuk, Iowa.....	12	June 10	7	17.25	June 22
Gregory Landing, Mo.....	12	June 10	8	16.8	June 23
Quincy, Ill.....	14	June 9	9	19.2	June 23
				19.6	Apr. 25
Hannibal, Mo.....	13	Apr. 21	13	22.5	May 28
				19.2	June 24
				19.2	Apr. 26
				13.2	May 6, 10
Louisiana, Mo.....	12	Apr. 21	14	19.8	May 28
				13.6	June 12
				17.0	June 24-25
Grafton, Ill.....	18	June 24	5	19.1	June 27-28
Missouri Basin					
Big Sioux: Akron, Iowa.....	12	11	15	16.5	15
	14	6	6	16.6	6
		11	15	17.2	12
Floyd: James, Iowa.....		2	2	19.4	2
Solomon: Beloit, Kans.....	18	7	7	19.6	7
		26	27	20.6	27
Big Blue:					
Beatrice, Nebr.....	16	24	24	16.85	24
Barnston, Nebr.....	18	24	24	20.4	24
Republican: Guide Rock, Nebr.....	9	24	24	10.2	24
Grand: Brunswick, Mo.....	12	June 10	14	14.4	June 15
				15.5	June 21
Missouri:					
Blair, Nebr.....	18	June 13	5	19.6	June 17
Nebraska City, Nebr.....	15	June 12	15	19.7	June 15
St. Joseph, Mo.....	17	June 14	7	19.1	June 18-19
Waverly, Mo.....	18	June 13	5	20.9	June 20
				19.3	4
Arkansas Basin					
Little Arkansas: Sedgwick, Kans....	18	11	12	23.6	11
North Canadian: Yukon, Okla.....	11	29	29	11.2	29

¹ Provisional.

CLIMATOLOGICAL DATA

CONDENSED CLIMATOLOGICAL SUMMARY OF TEMPERATURE AND PRECIPITATION BY SECTIONS

[For description of tables and charts, see REVIEW January 1943, p. 15]

In the following table are given for the various sections of the climatological service of the Weather Bureau the monthly average temperature and total rainfall; the stations reporting the highest and lowest temperatures, with dates of occurrence; the stations reporting the greatest and least total precipitation; and other data as indicated by the several headings.

The mean temperature for each section, the highest and lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperatures and precipitation are based only on records from stations that have 10 or more years of observations. Of course, the number of such records is smaller than the total number of stations.

Section	Temperature								Precipitation							
	Section average	Departure from the normal	Monthly extremes						Section average	Departure from the normal	Greatest monthly		Least monthly			
			Station	Highest	Date	Station	Lowest	Date			Station	Amount	Station	Amount		
	°F.	°F.		°F.			°F.		In.	In.		In.		In.		
Alabama.....	80.1	-0.2	2 stations.....	105	17	Huntsville.....	49	22	4.21	-1.38	Fairhope.....	11.41	South Hill.....	0.46		
Arizona.....	79.2	-1.0	3 stations.....	114	11	Fort Valley.....	33	10	1.18	-0.94	Elgin.....	4.61	8 stations.....	0.00		
Arkansas.....	81.2	+0.6	Conway.....	108	18	Brinkley.....	49	22	2.61	-1.12	Perryville.....	5.85	White Cliffs.....	0.66		
California.....	70.7	-2.7	2 stations.....	120	11	Boca.....	23	9	0.08	0.00	Blackbear.....	2.12	239 stations.....	0.00		
Colorado.....	66.5	-0.7	do.....	101	17	3 stations.....	26	17	2.25	+1.11	Kauffman.....	7.84	Greystone.....	0.03		
Florida.....	81.0	-0.3	Clermont.....	101	13	Avon Park.....	60	10	9.26	+1.93	Isleworth.....	21.49	Naples.....	1.36		
Georgia.....	78.8	-1.2	6 stations.....	103	17	Blairsville.....	49	5	4.83	-0.92	Brunswick.....	16.95	Adairsville.....	0.82		
Idaho.....	66.3	-1.8	Lewiston.....	107	27	Sun Valley.....	19	3	0.38	-0.28	Landmark.....	2.05	4 stations.....	0.00		
Illinois.....	76.2	-0.3	New Burnside.....	105	11	3 stations.....	43	21	1.82	-1.42	Waterloo.....	5.89	Waverly.....	0.09		
Indiana.....	76.2	+0.5	Forest Reserve.....	106	10	Marengo.....	41	21	1.68	-1.64	Shelbyville.....	3.78	Kokomo.....	0.37		
Iowa.....	72.6	-2.0	2 stations.....	98	10	Decorah.....	42	21	3.73	+0.05	Cushing (near).....	8.81	Centerville.....	0.93		
Kansas.....	77.4	-1.8	Medicine Lodge.....	106	8	Burr Oak.....	46	21	4.73	+1.60	Oberlin.....	11.83	Coffeyville.....	1.18		
Kentucky.....	77.5	+0.4	2 stations.....	103	10	Heidelberg.....	45	22	1.93	-2.23	Brownsville.....	4.90	Henderson.....	0.49		
Louisiana.....	83.2	+1.3	Lake Providence.....	108	17	2 stations.....	60	12	3.17	-2.92	Burrwood.....	9.81	Grand Cane.....	0.37		
Maryland-Delaware.....	76.0	+0.7	2 stations.....	100	17	Oakland, Md.....	39	22	2.47	-1.80	Oxford, Md.....	7.17	Great Falls, Md.....	1.08		
Michigan.....	68.9	-0.4	Wayne.....	99	7	Grayling.....	32	21	2.68	-0.05	St. Ignace.....	6.42	Battle Creek.....	0.61		
Minnesota.....	68.2	-1.9	Montevideo.....	95	2	3 stations.....	36	20	4.13	+0.86	Wadena.....	9.26	Thief River Falls.....	0.82		
Mississippi.....	81.6	+0.5	3 stations.....	105	17	Batesville.....	52	22	3.84	-1.22	Laurel.....	11.45	Flora.....	0.58		
Missouri.....	77.6	-0.5	Poplar Bluff.....	105	9	Seymour.....	40	21	2.62	-0.95	Lamar.....	6.75	Topaz.....	0.72		
Montana.....	64.8	-2.3	Libby.....	103	19	Lima.....	24	7	0.94	-0.44	Red Lodge.....	4.23	Thompson Falls.....	0.17		
Nebraska.....	73.5	-2.0	Box Butte Exp. Farm.....	102	18	2 stations.....	42	12	3.81	+0.72	Big Spring.....	8.65	Loup City.....	0.79		
Nevada.....	71.2	-1.4	2 stations.....	113	17	Malta Vista Ranch.....	28	10	0.07	-0.31	Paradise Valley.....	0.59	36 stations.....	0.00		
New England.....	70.2	+1.1	do.....	98	18	Lake Frontiere, Maine.....	31	19	3.08	-0.67	Turners Falls, Mass.....	9.93	Shelton, Conn.....	0.33		
New Jersey.....	75.6	+1.8	do.....	101	28	Runyon.....	44	22	1.44	-3.25	Culvers Lake.....	3.89	Long Branch.....	0.22		
New Mexico.....	71.9	-0.4	Corona.....	110	8	Eagle Nest.....	28	28	2.37	-0.10	White Tail.....	7.49	2 stations.....	T		
New York.....	71.2	+1.4	Dansville.....	99	7	Cherryplain.....	35	18	2.71	-1.19	Spencertown.....	9.13	Long Beach.....	0.38		
North Carolina.....	75.5	-1.4	2 stations.....	102	27	Mount Mitchell.....	41	4	6.44	+0.48	Pinehurst.....	14.00	Hot Springs.....	1.90		
North Dakota.....	67.6	-1.4	Carrington.....	102	24	Kenmare.....	33	8	1.74	-0.69	Milnor.....	10.61	Underwood.....	T		
Ohio.....	74.3	+0.6	Peebles.....	104	11	Canton.....	42	17	1.69	-2.11	Valley Crossing.....	3.93	Springfield.....	0.60		
Oklahoma.....	81.5	-0.3	Hollis.....	114	27	Sallisaw.....	49	28	3.05	+0.27	Hooker.....	7.20	Northside Disposal Plant.....	0.22		
Oregon.....	64.9	-1.6	Ilwaco.....	107	17	4 stations.....	25	12	0.45	+0.03	Crescent.....	4.62	16 stations.....	0.00		
Pennsylvania.....	72.2	0	2 stations.....	100	12	Kane.....	37	17	2.39	-1.87	Lycippus.....	5.19	Conshohocken.....	0.05		
South Carolina.....	78.0	-2.0	Orangeburg.....	105	17	2 stations.....	53	4	5.90	+0.02	Florence Airport.....	13.36	Greenville.....	2.40		
South Dakota.....	70.4	-2.8	Ottumwa.....	102	24	Ralph.....	37	8	3.49	+1.06	Bowdler.....	8.00	McIntosh.....	0.83		
Tennessee.....	78.0	+0.2	2 stations.....	104	19	Bolivar.....	43	22	2.14	-2.34	Chattanooga.....	6.93	Etowah.....	0.16		
Texas.....	83.8	+0.8	Eagle Pass.....	115	25	Mount Locke.....	48	24	1.68	-0.90	Shamrock.....	8.44	2 stations.....	0.00		
Utah.....	71.2	-0.6	2 stations.....	108	17	Panguitch.....	33	14	0.27	-0.63	Fruita.....	1.86	9 stations.....	0.00		
Virginia.....	75.3	-0.1	Diamond Springs.....	102	26	2 stations.....	40	14	3.48	-1.14	Dahlgren.....	9.78	Mount Weather.....	0.78		
Washington.....	67.2	+0.7	Dallesport.....	110	18	do.....	31	1	0.22	-0.45	Startup.....	1.75	20 stations.....	0.00		
West Virginia.....	72.6	-0.6	Great Cacapon.....	102	17	Cranberry Glades.....	34	14	2.65	-1.97	Shinniston.....	6.22	Wayne.....	0.68		
Wisconsin.....	69.2	-1.0	Kenosha.....	97	9	Danbury.....	35	20	2.43	-1.02	West Bend.....	4.94	Mondovi.....	0.88		
Wyoming.....	64.1	-1.7	Lovell.....	100	1	4 stations.....	28	11	1.43	+0.10	Albin.....	9.96	Afton.....	0.19		
Alaska (June).....	53.0	+0.4	Eagle.....	88	17	2 stations.....	23	12	1.53	-0.19	Whittier.....	4.94	Wainwright.....	0.15		
Hawaii.....	74.2	-0.1	Waianae.....	94	14	Haleakala Ranger Station.....	41	4	5.79	-0.23	Makahanalo No. 2.....	28.80	21 stations.....	0.00		
Puerto Rico.....	78.8	+0.2	Utua.....	96	15	Guineo Reservoir.....	57	3	9.64	+3.89	Rio Blanco (1800 ft.).....	25.57	Mora Camp.....	1.76		

1 Other dates also.

CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS

District and station	Elevation of instruments			Pressure		Temperature of the air										Precipitation			Wind				Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month	Number of days with thunderstorms					
	Barometer above sea level	Thermometer above ground	Anemometer above ground	Station	Sea level	Departure from normal	Mean	Departure from normal	Maximum	Date	Mean maximum	Minimum	Date	Mean minimum	Greatest daily range	Total degree days	Mean temperature of the dew-point	Mean relative humidity	Total	Departure from normal	Greatest in 24 hours	Days with 0.01 inch or more								Average hourly velocity	Prevailing direction	Maximum velocity		
																																Miles per hour	Direction	Date
New England																																		
Eastport	75	67	85	1,011.5	1,014.6	+1.1	61.6	+1.2	85	8	70	46	6	53	36	120	54	81	1.75	-1.3	.63	12	7.4	sw.	29	e.	27	13	8	10	5.1	0.0	0.0	3
Greenville, Maine	1,070	6	41	976.3	1,015.2	-.64	64.4	-.7	92	8	78	36	19	51	44	62	58	58	2.36	-1.9	.57	15	7.6	s.	27	s.	12	14	8	9	4.6	0.0	0.0	7
Portland, Maine	103	8	43	1,010.5	1,014.6	+.4	68.4	+.2	92	9	79	47	19	58	32	18	62	63	3.03	-.2	1.20	10	7.6	s.	27	s.	12	14	8	9	4.6	0.0	0.0	7
Concord	289	4	45	1,004.1	1,014.9	+.3	70.3	+.2	96	8	84	44	19	67	39	6	61	76	2.35	-1.2	.68	11	6.4	nw.	32	nw.	10	7	16	8	5.5	0.0	0.0	10
Burlington	403	6	51	999.0	1,013.5	-.4	72.1	-.1	96	8	84	49	2	60	35	2	62	72	3.63	+.1	.90	11	8.2	s.	28	s.	12	7	12	12	5.9	0.0	0.0	10
Boston	124	33	62	1,010.2	1,014.9	+.3	73.8	+.2	95	10	82	59	22	65	26	0	62	69	1.61	-1.9	1.06	8	9.6	sw.	33	sw.	12	11	11	9	5.0	0.0	0.0	6
Nantucket	12	11	59	1,014.9	1,015.9	+.7	70.2	+.2	84	7	77	55	3	63	22	2	65	86	1.04	-1.8	.35	6	10.4	sw.	25	sw.	13	16	5	10	4.7	0.0	0.0	2
Block Island	26	11	46	1,014.6	1,015.9	+.0	71.2	+.2	85	31	78	56	4	64	20	2	65	87	.42	-2.7	.25	7	12.3	sw.	36	nw.	16	3	11	7	4.6	0.0	0.0	4
Providence	159	46	60	1,009.8	1,015.9	+.0	70.0	+.2	95	9	86	55	3	66	29	0	62	74	.96	-2.3	.43	7	8.1	sw.	29	nw.	16	7	17	7	5.4	0.0	0.0	7
Hartford	159	5	44	1,009.5	1,015.6	+.7	74.2	+.2	94	9	86	52	22	62	32	0	63	72	.26	-2.1	.80	10	7.4	s.	28	sw.	12	7	17	7	5.4	0.0	0.0	8
New Haven	107	8	39	1,011.5	1,015.6	+.7	74.2	+.4	90	5	84	52	3	64	33	1	63	73	.73	-3.3	.20	10	6.7	sw.	19	sw.	12	8	19	4	4.7	0.0	0.0	7
Middle Atlantic																																		
Albany	97	26	40	1,010.5	1,014.6	-.0	73.8	+.2	96	7	86	51	22	62	34	1	62	70	1.82	-1.0	.52	13	7.0	s.	28	nw.	27	11	12	8	5.3	0.0	0.0	14
Binghamton	871	60	79	984.1	1,015.9	+.0	71.8	+.1	94	11	84	40	22	59	34	5	61	78	2.17	-1.5	1.42	8	5.0	w.	20	w.	12	7	15	9	5.4	0.0	0.0	10
New York	314	415	454	1,003.7	1,014.9	-.3	77.2	+.3	92	8	86	60	22	69	24	0	62	66	2.20	-2.0	.93	8	12.3	s.	40	n.	16	12	14	5	4.5	0.0	0.0	8
Harrisburg	374	30	49	1,002.0	1,015.6	+.4	77.1	+.2	97	7	89	55	22	65	33	0	63	66	.88	-3.0	.36	7	7.0	sw.	34	sw.	19	10	12	9	5.4	0.0	0.0	4
Philadelphia	114	6	56	1,011.5	1,015.9	+.7	78.4	+.3	97	7	89	56	22	67	31	0	64	66	1.05	-3.1	.61	7	7.6	sw.	25	sw.	30	9	15	7	5.3	0.0	0.0	6
Reading	323	47	306	1,003.7	1,015.6	+.7	78.2	+.2	95	7	90	57	22	67	30	0	64	66	.93	-3.3	.35	9	8.9	s.	40	nw.	29	12	14	5	4.4	0.0	0.0	4
Scranton	805	72	104	986.8	1,015.6	+.4	73.7	+.2	94	8	86	51	22	62	32	0	62	62	2.60	-1.4	1.17	7	5.6	n.	43	nw.	16	15	13	3	4.4	0.0	0.0	6
Atlantic City	62	37	172	1,013.9	1,015.9	+.7	73.3	+.2	92	5	79	60	22	68	25	0	66	82	1.50	-2.4	.78	6	14.1	s.	36	s.	12	11	11	6	4.5	0.0	0.0	5
Trenton	190	89	107	1,008.8	1,015.9	+.7	77.8	+.3	95	28	88	58	22	67	28	0	62	63	.37	-3.6	.13	5	8.1	sw.	24	sw.	12	11	15	5	4.9	0.0	0.0	6
Baltimore	123	100	215	1,011.2	1,015.9	+.7	79.7	+.2	97	25	89	61	22	70	27	0	65	67	2.81	-1.8	1.83	7	9.3	s.	36	sw.	30	12	16	3	4.4	0.0	0.0	6
Washington	112	56	100	1,011.9	1,016.3	+.4	79.2	+.2	97	6	90	60	22	69	31	0	64	66	2.44	-2.3	1.05	11	6.0	s.	24	w.	24	9	16	6	4.9	0.0	0.0	7
Cape Henry	18	8	54	1,015.6	1,016.3	-.7	78.4	+.9	98	27	86	63	5	70	26	0	67	74	3.78	-1.6	1.28	9	10.6	sw.	32	w.	27	9	16	6	5.1	0.0	0.0	7
Lynchburg	666	144	184	991.9	1,016.3	-.0	77.2	+.3	96	27	88	56	22	66	33	0	63	72	4.21	-.0	2.03	15	6.2	sw.	37	sw.	27	8	14	9	5.2	0.0	0.0	11
Norfolk	91	80	125	1,013.5	1,016.9	+.0	79.2	+.5	97	27	88	64	4	70	28	0	68	75	1.43	-4.3	.80	7	9.3	sw.	34	nw.	27	7	18	6	5.3	0.0	0.0	8
Richmond	144	11	52	1,010.5	1,015.6	-.7	78.4	-.1	98	6	89	58	4	68	32	0	66	72	5.51	+.8	1.69	9	7.2	sw.	27	nw.	13	12	12	7	5.0	0.0	0.0	10
South Atlantic																																		
Asheville	2,253	77	92	939.4	1,016.6	-.0	72.6	+.9	92	17	84	53	22	61	32	6	60	76	6.24	+.1	2.40	14	5.7	se.	24	nw.	19	3	14	14	6.5	0.0	0.0	10
Charlotte	779	63	86	985.8	1,016.6	-.0	77.4	-.1	99	27	87	60	4	65	29	0	66	77	11.68	+.6	6.59	15	5.9	s.	26	nw.	1	6	10	15	6.5	0.0	0.0	10
Greensboro	886	6	56	985.4	1,016.9	-.7	76.0	-.0	94	27	87	56	4	65	35	0	66	78	6.63	-.0	4.43	12	6.9	s.	25	nw.	13	3	16	12	6.4	0.0	0.0	11
Hatteras	11	5	30	1,016.6	1,016.9	+.6	78.6	+.4	86	27	84	66	24	74	18	0	71	80	4.75	-.7	3.11	7	11.9	sw.	28	nw.	28	7	18	6	5.1	0.0	0.0	5
Raleigh	376	27	69	1,003.4	1,016.9	+.3	78.0	-.8	96	27	89	58	4	67	32	0	66	76	5.31	-.1	2.94	13	8.1	sw.	24	s.	29	9	15	7	5.2	0.0	0.0	7
Wilmington	72	73	107	1,014.2	1,016.6	+.3	78.6	-.5	94	17	86	64	4	71	21	0	70	80	5.14	-2.0	1.17	15	8.8	s.	29	s.	28	7	14	10	5.8	0.0	0.0	12
Charleston	48	11	92	1,014.2	1,016.3	-.6	80.0	-.1	94	29	86	68	22	74	23	0	74	84	4.29	-2.6	2.01	12	10.0	s.	26	e.	4	13	10	6.3	0.0	0.0	6	
Columbia, S. C.	347	70	91	1,003.7	1,016.6	-.0	78.9	-2.0	98	27	89	62	4	69	25	0	68	78	8.44	+.3	2.50	12	6.7	s.	25	sw.	28	7	11	13	5.9	0.0	0.0	10
Greenville, S. C.	1,040	18	36	979.7	1,016.3	-.7	76.9	-.0	98	27	87	61	6	67	28	0	64	71	2.40	-3.0	1.19	13	7.8	ne.	27	n.	30	6	12	13	6.4	0.0	0.0	7
Augusta	182	62	77	1,009.1	1,015.6	-.1	80.3	-.1	100	27	90	64	6	70	27	0	66	72	2.72	-2.7	1.03	12	5.5	s.	24	w.	31	7	14	10	6.0	0.0	0.0	10
Savannah	65	73	132	1,013.5	1,016.3	-.6	80.2	-.1	95	17	88	68	7	72	26	0	72	84	7.14	+.5	2.43	14	9.1	s.	38	sw.	29	1	22	8	6.4	0.0	0.0	12
Jacksonville	43	56	1.0	1,014.9	1,016.6	-.3	80.4	-.1	96	18	88	68	3	72	26	0	72	84	14.20	+.7	5.00	23	7.0	sw.	31	ne.	18	4	17	10	6.2	0.0	0.0	17
Florida Peninsula																																		
Key West																																		
Miami	25	242	249	1,015.2	1,016.6	-.6	85.3	+.1	92	7	90	72	30	80	17	0	74	72	3.38	+.1	1.67	9	7.3	e.	24	sw.	20	8	19	4	4.8	0.0	0.0	10
Tampa	35	6	43	1,015.2	1,016.6	-.7	82.6	+.1	93	18	90	72	12	75	19	0	73	78	4.04	-3.9	1.11	15	8.1	s.	26	se.	28	2	21	8	6.3	0.0	0.0	19
East Gulf																																		
Atlanta	1,173	33	72	974.9	1,015.6	-1.0	78.3	-.8	100	17	89	63	7	68	28	0	64	70	2.30	-2.5	.54	12	7.9	e.	40	nw.	19	6	14	12	6.1	0.0	0.0	10
Macon	370	79	87	1,002.4	1,015.6	-1.0	79.4	-1.8	100	17	89	63	4	70	28	0	67	72	3.86	-.9	1.21	11	5.7	s.	25	n.	19	10	13	8	5.7	0.0	0.0	7
Thomasville																																		

CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS—Continued

District and station	Elevation of instruments			Pressure		Temperature of the air										Precipitation		Wind																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	Barometer above sea level	Thermometer above ground	Anemometer above ground	Station	Sea level	Departure from normal	Mean				Maximum				Minimum				Total				Maximum velocity																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
							Mean	Departure from normal	Maximum	Date	Mean	Minimum	Date	Mean	Greatest daily range	Total degree days	Mean temperature of the dew point	Mean relative humidity	Total	Departure from normal	Greatest in 24 hours	Days with 0.01 inch or more	Average hourly velocity	Prevailing direction	Miles per hour	Direction	Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month	Number of days with thunderstorms																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Ohio Valley and Tennessee	ft.	ft.	ft.	fts.	fts.	fts.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	%	In.	In.	In.	fts.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												

CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS—Continued

District and station	Elevation of instruments			Pressure			Temperature of the air										Precipitation			Wind				Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month	Number of days with thunderstorms					
	Barometer above sea level	Thermometer above ground	Anemometer above ground	Station	Sea level	Departure from normal	Mean	Departure from normal	Maximum	Date	Mean minimum	Date	Mean minimum	Greatest daily range	Total degree days	Mean temperature of the dew point	Mean relative humidity	Total	Departure from normal	Greatest in 24 hours	Days with 0.01 inch or more	Average hourly velocity	Prevailing direction								Maximum velocity		Date		
																															Miles per hour	Direction			
Northern Slope																														0-10					
																														4.4					
Billings ¹	3,570	16	40	892.0	1,013.5	69.4	-2.6	96	1	82	49	11	57	35	20	46	52	1.29	63	7	9.7	sw.	45	nw.	5	11	16	4	4.3	.0	.0	.0	8		
Havre	2,507	11	67	926.2	1,013.2	68.6	+3	98	28	84	39	8	54	42	36	46	52	1.09	41	10	8.0	nw.	31	nw.	13	13	13	5	4.5	.0	.0	.0	8		
Helena ¹	4,124	5	43	875.0	1,014.6	+1.1	64.6	-1.1	92	28	80	39	8	50	43	71	45	56	1.42	47	8	7.8	w.	44	sw.	12	14	10	7	4.2	.0	.0	.0	12	
Missoula ¹	2,205	80	91	902.8	1,014.9	68.0	+5	95	18	83	43	3	53	40	29	44	52	1.45	24	6	6.6	w.	31	nw.	1	16	14	1	4.0	.0	.0	.0	7		
Kalispell	2,973	48	56	912.0	1,012.9	-6.65	+1.6	93	19	80	41	3	51	40	54	42	50	1.60	28	9	6.2	w.	25	sw.	1	13	13	5	4.3	.0	.0	.0	7		
Miles City ¹	2,371	5	28	930.9	1,013.2	70.1	0	95	29	83	49	9	57	35	19	51	58	1.68	34	7	7	nw.	34	nw.	13	17	1	3.9	.0	.0	.0	10			
Rapid City ¹	3,259	5	63	902.8	1,014.2	+7.69	-2.0	94	28	82	47	8	56	43	18	54	66	1.54	25	14	12.8	nw.	63	w.	9	13	12	6	4.5	.0	.0	.0	17		
Cheyenne ¹	6,094	5	40	816.5	1,014.2	+1.0	66.4	-3	90	17	81	46	26	52	41	27	46	60	1.06	1.70	11	9.4	nw.	34	w.	5	6	17	8	5.4	.0	.0	.0	13	
Lander	5,352	60	68	837.1	1,012.9	-2	66.2	-1.2	89	17	82	46	20	51	41	21	44	50	1.06	4.45	7	5.3	sw.	26	w.	4	14	15	2	4.0	.0	.0	.0	11	
Sheridan ¹	3,790	5	38	885.5	1,014.6	67.0	-1.4	94	1	82	46	11	52	37	33	50	64	1.55	69	8	6.8	s.	43	w.	22	10	14	7	4.8	.0	.0	.0	13		
North Platte ¹	2,821	11	51	916.7	1,013.2	-3	67.6	+7	95	2	85	55	12	62	31	1	59	68	3.07	1.71	16	7.5	s.	28	s.	5	10	16	5	4.9	.0	.0	.0	18	
Middle Slope																														77.5		-0.2			
Denver ¹	5,292	106	113	840.5	1,013.9	+1.0	71.8	-4	96	30	84	53	19	60	34	6	48	54	1.92	2.74	12	7.1	s.	26	nw.	7	9	15	7	5.2	.0	.0	.0	14	
Pueblo ¹	4,690	5	36	858.8	1,013.2	+3	73.4	-8	100	30	89	54	27	58	46	4	50	58	2.91	1.50	8	7.6	nw.	43	ne.	18	11	15	5	5.0	.0	.0	.0	12	
Concordia	1,392	50	58	965.5	1,013.9	-3	77.5	-5	102	7	88	54	21	67	36	0	62	64	5.15	1.4	12	7.0	s.	43	nw.	7	15	10	6	4.5	.0	.0	.0	12	
Dodge City ¹	2,509	5	58	927.5	1,012.9	-6	77.0	-1.4	99	17	90	57	20	64	35	0	63	68	5.40	2.3	9	12.8	s.	39	w.	24	11	11	9	5.3	.0	.0	.0	12	
Wichita ¹	1,358	6	64	966.8	1,013.9	-7	79.6	+2	100	7	91	58	21	68	31	0	64	64	5.49	2.1	9	11.6	s.	57	nw.	27	12	13	6	4.8	.0	.0	.0	10	
Oklahoma City ¹	1,214	10	47	971.2	1,013.5	-1.1	82.6	+2.0	102	17	94	62	20	72	29	0	66	64	1.79	1.91	4	7.4	s.	24	s.	30	11	13	7	4.8	.0	.0	.0	9	
Tulsa ¹	674	10	61	960.5	1,013.9	-80.9	-2	102	26	92	60	22	70	30	0	67	70	1.89	1.4	57	7	7.8	s.	46	nw.	27	10	18	3	5.0	.0	.0	.0	8	
Southern Slope																														82.2		+1.6			
Abilene ¹	1,738	4	41	953.3	1,012.2	-1.3	84.0	+2.9	107	27	96	65	21	72	34	0	65	62	3.76	1.86	5	10.8	se.	30	sw.	23	12	12	7	4.4	.0	.0	.0	6	
Amarillo ¹	3,676	5	42	890.6	1,012.5	-7	77.1	+1.2	104	31	89	59	21	65	37	3	60	64	5.06	2.32	11	12.9	se.	52	sw.	11	11	13	7	5.1	.0	.0	.0	11	
Del Rio	969	63	71	979.0	1,010.8	-1.7	87.7	+1.4	106	28	98	69	1	77	29	0	65	54	1.01	2.4	1	10.0	se.	25	e.	21	11	20	0	4.1	.0	.0	.0	2	
Rowell	3,566	75	85	893.0	1,011.5	-4	79.8	+9	102	31	98	60	14	66	37	0	56	54	1.52	1.48	10	7.2	s.	28	w.	13	14	16	1	4.4	.0	.0	.0	12	
Southern Plateau																														81.9		+0.4			
El Paso ¹	3,778	5	85	886.2	1,009.8	-7	82.3	+2.6	104	31	95	63	23	70	32	0	52	43	1.52	1.00	4	8.9	n.	38	e.	13	9	17	5	4.9	.0	.0	.0	13	
Albuquerque ¹	5,314	5	48	840.2	1,010.8	-76.4	-3	97	30	90	57	21	63	35	0	52	48	1.58	2.72	11	9.4	se.	80	se.	18	12	13	6	4.8	.0	.0	.0	13		
Flagstaff	6,907	36	51	795.1	1,009.8	-65.6	-1	88	17	82	43	26	49	41	20	38	46	1.74	1.02	7	7	nw.	25	ne.	16	10	5	4.1	.0	.0	.0	7			
Phoenix ¹	1,107	39	87	971.2	1,008.1	-4	80.9	+1.1	111	29	104	66	13	75	43	0	51	33	1.70	4.70	2	6.5	e.	25	ne.	22	18	10	3	3.6	.0	.0	.0	3	
Tucson ¹	2,555	6	30	924.5	1,009.1	-87.4	-1.0	100	29	101	65	12	74	39	0	50	34	1.77	1.37	6	5.3	se.	20	e.	12	8	11	5	1.0	.0	.0	.0	5		
Yuma	142	9	54	1,003.7	1,007.8	0	89.6	+1.2	114	18	107	65	10	72	42	0	48	32	1.00	2.00	0	5.3	s.	20	e.	23	29	2	0	1.0	.0	.0	.0	0	
Middle Plateau																														72.4		-0.1			
Reno ¹	4,527	20	52	863.2	1,013.5	+2.0	67.3	-8	97	17	89	36	9	45	52	17	40	48	1.28	0.23	2	7.7	nw.	35	s.	25	22	9	0	2.1	.0	.0	.0	5	
Tonopah	6,090	9	20	815.8	1,010.8	-72.4	-1.2	89	1	85	52	9	60	31	0	24	16	T	0	0	1	7.4	se.	24	nw.	25	26	5	0	2.4	.0	.0	.0	3	
Winnemucca	4,339	5	56	867.6	1,011.5	-1.0	71.7	+1.1	98	17	90	42	10	53	47	5	37	34	1.01	2.01	1	7.4	se.	24	nw.	25	26	5	0	2.4	.0	.0	.0	3	
Modena	5,473	10	46	835.1	1,011.2	0	69.1	-1.5	94	18	85	45	5	50	44	0	44	36	1.04	1.04	0	11.5	sw.	34	s.	1	27	3	1	1.6	.0	.0	.0	1	
Salt Lake City ¹	4,227	32	46	866.6	1,010.5	-2	76.0	+2.0	99	18	92	48	11	60	40	0	44	36	1.04	1.04	0	11.5	sw.	34	s.	20	22	9	0	2.4	.0	.0	.0	6	
Grand Junction	4,602	60	68	860.1	1,012.9	+7	77.6	-1	97	30	92	56	24	63	34	0	40	34	1.75	1.40	6	7.0	se.	36	sw.	22	18	10	3	3.3	.0	.0	.0	14	
Northern Plateau																														71.3		+0.8			
Baker ¹	3,471	36	54	866.7	1,015.2	+1.0	65.4	-2	96	18	82	37	2	48	44	71	42	56	1.19	1.15	3	5.9	n.	22	sw.	28	21	8	2	3.1	.0	.0	.0	4	
Boise ¹	2,739	5	49	918.7	1,012.5	-1.0	72.2	-3	98	28	87	45	2	57	38	8	45	41	1.06	2.04	3	5.6	nw.	56	w.	29	17	14	0	3.4	.0	.0	.0	5	
Pocatello ¹	4,478	5	31	863.2	1,012.5	-7	69.5	-7	96	17	87	44	11	52	46	3	39	42	1.11	1.3	97	3	8.7	sw.	36	s.	31	15	5	1	3.4	.0	.0	.0	8
Spokane ¹	1,929	27	42	946.2	1,013.9	-7	69.7	+7	98	27	85	43	3	54	43	29	42	49	1.21	1.5	21	8.7	ne.	29	w.	6	17	11	3	3.6	.0	.0	.0	1	
Walla Walla	991	57	65	979.0	1,013.9	-1.0	75.8	+1.5	104	18	89	82	3	63	39	0	49	41	1.01	1.01	1	6.6	s.	21	sw.	29	24	4	3	2.3	.0	.0	.0	1	
Yakima	1,076	58	67	976.3	1,014.6	-75.2	+3.8	103	27	89	48	2	61	36	8	---	---	26	-1	1.26	1	7.7	nw.	21	nw.	6	19	7	5	4.2	.0	.0	.0	1	
North Pacific Coast																														64.3		+0.4			
North Head	211	5	56	1,012.9	1,020.0	+1.4	56.9	-3	66	29	61	48	8	53	12	249	54	90	47	-5	09	16	12.1	n.	30	n.	7	2	6	23	8.1	.0	.0	.0	1
Seattle ²	125	90	321	1,014.2	1,018.6	+1.3	65.4	-1	96	18	75	51	6	56	36	44	52	65	33	-3	14	8	7.6	n.	21	sw.	5	11	10	10	5.2	.0	.0	.0	0
Tacoma	194	172	201	1,011.9	1,018.3	+3	64.6	+1.8	88	18	74	50	2	56	29	57	---	---	01	-6	01	1	8.1	n.	26	sw.	18	10	16	5	4.6	.0	.0	.0	0
Tatoosh Island	86	9	61	1,016.9	1,020.0	+2.4	54.4	-7	66	17	58	45	8	51	14	333	52	92	19	-6	35	11	11.6	s.	37	s.	19	2	8	21	7	7.0	.0	.0	5
Medford ¹	1,329	20	58																																

CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS—Continued

District and station	Elevation of instruments			Pressure			Temperature of the air										Total degree days	Mean temperature of the dew point	Mean relative humidity	Precipitation				Wind				Total snowfall	Snow, sleet, and ice on ground at end of month	Number of days with thunderstorms				
	Barometer above sea level	Thermometer above ground	Anemometer above ground	Station	Sea level	Departure from normal	Mean	Departure from normal	Maximum	Date	Mean maximum	Minimum	Date	Mean minimum	Greatest daily range	Total				Departure from normal	Greatest in 24 hours	Days with 0.01 inch or more	Average hourly velocity	Prevailing direction	Maximum velocity						Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths
																									Miles per hour	Direction	Date							
Alaska																																		
Anchorage ¹	132	6	44	1,011.2	1,016.3	56.2	-1.8	78	6	64	40	29	48	30	50	50	2.53	17	5.1	nw.	19	sw.	20	5	3	23	7.7	0	0	0				
Fairbanks ¹	455	4	63	995.6	1,012.5	61.0	+1.0	85	11	73	41	27	50	33	50	72	1.90	11	6.9	w.	26	w.	16	1	11	19	7.5	0	0	2				
Juneau ¹	80	0	21	1,015.6	1,018.6	55.6	0	76	11	64	43	15	48	31	48	78	3.72	18	7.4	n.	23	e.	22	2	6	23	7.2	0	0	0				
Nome	22	25	56	1,012.2	1,012.9	49.5	-1.4	67	23	54	37	22	45	23	46	88	2.88	11	9.5	w.	25	se.	16	4	6	10	7.4	0	0	0				
Bethel	28	7	31	1,012.5	1,013.9	57.0	+2.5	78	8	65	42	5	49	29	32	82	2.53	19	8.2	nw.	24	sw.	17	4	0	29	7.3	0	0	2				
Gambell	32	5	32	1,010.8	1,011.9	43.5	-1.2	59	9	47	37	30	40	21	42	95	1.70	15	13.0	sw.	28	se.	9	0	0	29	7.0	0	0	0				
Ketchikan	75	69	90	1,018.0	1,018.6	58.4	+1.7	79	30	65	50	2	52	26	51	78	8.22	16	6.7	se.	23	w.	30	4	0	22	7.3	0	0	0				
Kotzebue	20	5	31	1,011.5	1,012.2	53.2	+0.7	74	9	58	42	13	45	25	49	67	1.43	11	11	sw.	22	sw.	17	2	2	15	16	7.0	0	0	0			
McGrath	331	5	31	1,001.0	1,013.5	61.2	0	84	9	72	42	27	50	33	49	68	1.76	12	12	nw.	22	ssw.	17	3	12	16	7.1	0	0	2				
Northway	1,718	5	32	951.9	1,013.5	60.0	0	83	11	71	42	20	49	32	47	68	1.86	14	8.8	w.	25	sw.	6	0	12	19	7.7	0	0	4				
Summit	2,405	5	30	930.2	1,016.9	53.5	0	78	10	62	40	21	45	30	47	78	3.11	14	14	sw.	25	sw.	6	1	4	26	8.8	0	0	2				
Hawaii																																		
Honolulu	38	86	100	1,016.3	1,017.3	77.8	+1.1	84	11	82	71	3	74	11	0	30	0	0	30	-0.8	15	7	10.4	e.	23	e.	2	14	13	4	4.4	0	0	0

¹ Data are airport records.² Barometric data (adjusted to old city elevation) and hygrometric data from airport otherwise city office records.³ Observations taken bihourly.⁴ Pressure (adjusted to old city elevation), temperature, and hygrometric data from airport; otherwise city office records.⁵ Temperature and precipitation from city records, other data from airport.Norz.—Except as indicated by notes ¹, ², ³, and ⁴ data in table are city office records.

SEVERE LOCAL STORMS, JULY 1944

[Compiled by Mary O. Souder]

[The table herewith contains such data as has been received concerning severe local storms that occurred during the month. A revised list of tornadoes will appear in the United States Meteorological Yearbook]

Place	Date	Time	Width of path, yards	Loss of life	Value of property destroyed	Character of storm	Remarks
Fergus County, Mont.	July 1	4:30 p.m.	14		\$10,000	Moderate hail.	Loss in crops; path 6 miles long.
Hamel and Robbinsdale, Minn., and vicinity.	1	p.m.				Hail, electrical.	Considerable damage to growing crops in places.
Maple Plain, Minn., vicinity of.	1	do			900	Electrical.	7 cows on 1 farm killed by lightning.
Minneapolis, Minn., and vicinity.	1	do			10,000	do	Property damaged.
Minneapolis and St. Paul, Minn., and vicinity.	1	do				Rain and hail.	Damages in places to real property and growing crops. In the Diamond Lake district, Minneapolis, the ground was white being covered with hailstones about the size of cherries.
Waukon, Iowa, vicinity of.	1				7,000	Electrical.	Barn and contents burned.
Blaine County, Mont.	2	4:30 p.m.	126		5,500	Light to heavy hail.	Loss in wheat and barley; path 30 miles long. Loss in crops, \$5,000; property damage, \$500.
Fergus Falls, Minn., and vicinity.	2-3	10:15 p.m.—4:15 a.m. C. W. T.			16,400	Electrical and heavy rain.	Church struck by lightning and burned; several residences and barns damaged; cattle killed.
Teton County, Mont.	4	7 p.m.	2		5,000	Light hail.	Loss in crops, \$5,000; gardens damaged; path 20 miles long.
Gallatin County, Mont.	5	4 p.m.	2		150,000	Heavy hail.	Loss in canning peas, hay, and grain; path 10 miles long.
Valley County, Mont.	5	5-6 p.m.	880		15,000	do	Loss in wheat and flax; path 2 miles long.
Lemmon, S. Dak., and vicinity.	5	6:15-6:40 p.m.	125	0	200,000	Tornado.	Numerous buildings wrecked; several roofs sheared off; some stock killed; crops flattened; 3 persons injured; crop loss not serious.
Fallon County, Mont.	5	p.m.	2,640		25,000	Heavy hail.	Loss in wheat, barley, and flax; path 5 miles long.
Valley County, Mont.	6	5:30 p.m.	880		500	Hail.	Loss in wheat and oats; path 850 yards long.
Chouteau County, Mont.	6	p.m.	2,640		25,000	Light to heavy hail.	Loss in wheat, oats, barley, and gardens; path 10 miles long.
Sioux City, Iowa, and vicinity.	6-7	p.m.	880-1,760		2,000,000	Excessive rain, flood, electrical.	Heavy rains fell over lower Floyd River and Perry Creek Valleys. Both streams rose sharply and overflowed, but the Perry Creek flood caused the greatest damage which was estimated at about \$1,000,000 in Sioux City. Basements and lower floors were flooded and streets and sidewalks covered with silt and slimy mud. 1,000 acres of land were flooded affecting 1,161 families with 465 houses and 522 other buildings damaged and 10 buildings destroyed. Loss in gardens and crops over an area covering 8 square miles. Electrical service in Morningside was interrupted because of lightning which also caused a fire in a stockyard shed filled with hay and was believed to have been responsible for the cave-in of the roof and large sections of sidewalks of a garage in which large transport trucks were stored.
Ainsworth, Nebr.	7	3:30 p.m., E. S. T.	15			Heavy hail.	All small grain in path of storm damaged with considerable loss; path 8 miles long.
Idalia, Colo.	7	4:30-5 p.m.	12 1/2		10,000	Moderate hail.	Considerable loss in wheat; path 25 miles long.
Beadle, Kingsbury, and Spink Counties, S. Dak.	7	5:30 p.m.	1-3			Wind, rain, and hail.	High northwest to southeast winds accompanied by heavy rain and some hail in the vicinity of Carpenter, S. Dak., wrecked several farm buildings; flattened many grain fields; 1 person injured; path 20 miles long.
Concordia, Kans., and vicinity.	7	6:26 p.m.	16	0	350,000	Straight-line wind, tornado and hail.	Chief damage from wind; crop loss, \$100,000; property damage, \$250,000; path 30 miles long.

¹ Miles instead of yards.

SEVERE LOCAL STORMS, JULY 1944—Continued

Place	Date	Time	Width of path, yards	Loss of life	Value of property destroyed	Character of storm	Remarks
North Platte Valley, Nebr.	7	7:45-8:05 p. m., E. S. T.	14	0	\$3,000,000	Wind and hail.....	Scotts Bluff and Sioux Counties portions of the valley affected. Some poultry and livestock killed and windows damaged. Loss in crops; path 100 miles long.
Alexandria, Minn., vicinity of.	7	8:40-8:50 p. m., C. W. T.	880	0	10,000	Tornado.....	A funnel cloud reported in the west about a mile from Alexandria Airport. Rotary winds uprooted trees which were reported lying on the ground in different directions. Storm moved from west to east over a path about 5 miles long. Loss principally in crops; path 4 miles long.
Scott City, Kans., vicinity of.	8	3:30 p. m.	12		15,000	Heavy hail.....	
Larned, Kans., vicinity of.	8	4 p. m.	300	0	800	Tornado and hail.....	Damage from tornado, \$600; from hail, \$200; path 400 yards long.
Liberal, Kans.	8	4-5:30 p. m.	11		6,000	Heavy hail.....	Loss in wheat; path 3 miles long.
Sublette, Kans., vicinity of.	8	5 p. m., M. W. T.	200	0	500	Tornado.....	Property damaged; path 1 mile long.
Ardmore, S. Dak., and vicinity.	9	1:30 a. m.	3		5,000	Wind and hail.....	Spotted damage to crops; path 10 miles long.
Enid, Okla.	9	5:30 p. m.			6,650	Electrical.....	Barn destroyed and 200 sheep and some hay burned.
Canton to Potsdam, N. Y.	9				3,000	Wind.....	Large barn demolished; silo blown over; buildings unroofed; trees uprooted.
Colorado Springs, Colo.	10	5-7 p. m.	1,320			Hail and heavy rain.....	Loss in beans and corn. Some crops a complete loss in worst storm in 18 years. Path 20 miles long.
New York, central and northern portion of State.	10			1	10,000	Electrical, hail, and wind.	At Canastota power lines were broken causing the closing of 3 war plants. At Waddington and vicinity hail caused heavy damage to crops. Barns and silos severely damaged by wind and large barn and warehouse burned.
West Union, Ind.	11	p. m.			2,000	Wind and hail.....	Roofs, trees and wires damaged by wind.
Rawlins and Thomas Counties, Kans.	12	6:30 p. m.	16		1,200,000	Heavy hail and wind.....	600,000 bushels of wheat destroyed. Property damage \$200,000 included in estimate; path 28 miles long.
Thomas County, Kans., southwestern portion.	12	p. m.				Heavy hail.....	Crops a complete loss in some parts of the storm's path.
Rome, N. Y.	12					Thundersquall.....	Thousands of dollars damage at Rome Airport; light planes damaged and trees uprooted.
Hayden, N. Mex.	13	3-6 a. m.	12		1,200	Hail and rain.....	Property damaged; path 5 miles long.
Big Spring, Nebr.	13	4:25 p. m., E. S. T.	30	0	100	Tornado.....	Tornado well formed, but did not occur where much damage could result; loss in crops.
Roscoe to Andover, S. Dak.	14	4:30-6:30 a. m.	12-3		25,000	High wind.....	Some grain fields flattened and small buildings wrecked; property damaged \$25,000.
Brandon, Nebr., vicinity of.	14	5 p. m., E. S. T.	110		350,000	Hail and wind.....	Principal loss in wheat crop; path 10 miles long.
Lyon, Sioux, Osceola, O'Brien, and Clay Counties, Iowa.	14	5 p. m.	13		1,500,000	Hail.....	Destructive crop loss ranged from 5 to 50 percent. Several small buildings wrecked; path 15 miles long.
Cherokee and Ida Counties, Iowa.	14	6:30 p. m.			100,000-150,000	Hail and wind.....	Crops in 100 square miles affected; trees uprooted.
Emmet, Kossuth, Winnebago, Hancock, and Worth Counties, Iowa.	14	do.		0	150,000	Tornado, wind, and hail.	Several barns destroyed and about 75 damaged; 100 or more other structures damaged or wrecked; considerable number of livestock and chickens killed; 1 person injured.
Byers, Colo.	14	7:20 p. m.	15-10		500,000	Hail and wind.....	Much loss in beans, barley, corn and wheat; some property damage; path 100 miles long.
Nora, Ruskin, and Sedan, Nebr., vicinities of.	14	9:30 p. m., E. S. T.			6,000	Hail.....	Principal loss in corn.
Hodgeman County, Kans.	15	4 p. m.	15		10,000	Heavy hail.....	Loss in crops; path 8 miles long.
Buckeye, Kans., and vicinity.	15	6:40 p. m.	11		5,000	Hail and wind.....	Gardens ruined; windows broken; path 1 mile long.
Stafford, Kans., vicinity of.	16	7 p. m.	440		600	Wind.....	Damage to power lines and small farm buildings; path 1 mile long.
Johnstown, Nebr., vicinity of.	16	7:30 p. m., E. S. T.	12		5,000	Hail.....	Loss in small grain and fruit; path 3 miles long.
Nickerson, Kans., and vicinity.	16	7:45-8 p. m.	13		2,500	Heavy hail.....	Damage chiefly to roofs and windows; path 12 miles long.
Johnstown, Nebr., vicinity of.	16	8 p. m., E. S. T.	13		2,500	Hail.....	Principal loss in small grains and fruit; property damaged; path 5 miles long.
Helena, Okla.	16	10:30 p. m.	12		4,500	Wind and hail.....	Crop loss, 2,000; crop damage, 2,500; path 3 miles long.
Cherokee, Okla.	17		12		55,000	Hail.....	Loss in alfalfa, feed crops, and pastures, poultry and livestock, path 8 miles long; loss in crops, \$50,000; property damage, \$5,000.
Noble County, Ind.	19-20	p. m.				do.	Much loss in corn.
Roosevelt, Mont.	20	3 p. m.	11		1,000	Light hail.....	Loss in wheat; path 3 miles long.
Ironduff and Webster, N. Y.	20		12			Heavy hail.....	Unestimated damage to fruit and vegetable crops; on some farms a complete loss.
Dawson County, Mont.	21	6-7 p. m.	12		8,000	Moderate hail.....	Loss in wheat and barley; small property damage; path 15 miles long.
Nekoma, Kans., vicinity of.	22	6 p. m.	13		350,000	Heavy hail.....	Loss mostly in crops; path 10 miles long.
Otis, Kans., vicinity of.	22	do.	880	0	1,500	Tornado.....	Storm traveled through rural section; path 1 1/4 miles long.
Mankato, Minn., and vicinity.	22	7:30 p. m., C. W. T.	11		25,000	Thunderstorm and hail.	Greenhouses damaged; loss in growing crops and gardens. Property damage, \$7,000; loss in crops and gardens, \$15,000.
Tecumseh, Nebr., and vicinity.	23	3-4:45 C. W. T.	15		5,000,000	Wind, hail, and rain.....	5.25 inches of rain fell in less than 2 hours. Principal loss in corn, alfalfa, brome grass and pastures. About 25 town residences and business places and city light plant had considerable damage; soil washed; path 14 miles long.
Boone, Union, Polk, Jasper, and Lee Counties, Iowa.	23	4-6 p. m.			35,000	do.	Property damaged; barn burned and 25 hogs killed by lightning.
Dane and Madison Counties, Wis.	23	5-5:15 p. m., C. S. T.	67	0	20,000	Tornado and hail.....	Storm occurred 3 miles south of Windsor in Dane County and 2 miles north of Truax Field, Madison County. 2 barns and 7 smaller farm buildings razed. Path 1 1/4 miles long. Property damage, \$15,000; loss in crops, \$5,000.
Gage County, Nebr., northwestern portion.	23	7 p. m., E. S. T.	18		235,000	2 hailstorms.....	Principal loss in both storms in corn. \$235,000 damage from both storms. Path of first 15 miles long.
Gage County, Nebr., extreme southeastern portion.	23	8 p. m.	14		A amount of loss included in above amount.	do.	Path 6 miles long.
Marshall and Washington Counties, Kans.	23	8 p. m.	13		100,000	Heavy hail.....	Greatest damage in vicinity of Home City. Loss in corn; gardens ruined; trees defoliated, and property damaged; path 35 miles long.
Dane and Jefferson Counties, Wis.	23	8 p. m., C. S. T.				Hail.....	Loss in tobacco; much loss in corn and vegetables. Some property damaged.
Culbertson, Nebr.	23	8:15 p. m., E. S. T.	15			do.	Considerable property destroyed, not estimated. Path 5 miles long.

1 Miles instead of yards.

SEVERE LOCAL STORMS, JULY 1944—Continued

Place	Date	Time	Width of path, yards	Loss of life	Value of property destroyed	Character of storm	Remarks
Milwaukee and Waukesha Counties, Wis.	23					Severe thundersquall	An extreme wind velocity of 58 miles per hour recorded at 7:41 p. m., blew down a considerable number of trees and utility poles and wires and broke windows. The high winds blew automobiles into each other and into ditches. There were many traffic tieups and accidents. 6 injured persons received hospitalization.
Lawrence County, Ind.	24	5:30 p. m.	1 2		20,000	Wind and hail	Buildings, trees, and wires damaged; loss in crops.
Dodge City, Kans., and vicinity	24	7:15 p. m.		0		Small tornado	Vortex cloud touched the ground once and then in a wheat field, causing no damage.
Lawrence County, Ind.	25	12:30 a. m.	1 2		1,500	Wind and hail	Trees and wires damaged; loss in crops.
Chadron, Nebr.	25	3:30 p. m., E. S. T.	1 2			do	Loss in wheat; 50 percent of grain knocked off; path 5 to 6 miles long.
Tamaha, Okla.	27	11 a. m.	880		3,000	Wind	Damage to houses and barns.
Webber Falls, Okla.	27	11:45 a. m.			1,000	do	Loss in crops.
Sallisaw, Okla.	27	12:20 p. m.	1 15		85,000	do	Do.
Poteau, Okla.	27	1 p. m.			500	do	Do.
Adams and Union Counties, Iowa	27	2 p. m.	1		35,000	Hail	Crops seriously damaged in some areas; path 30 miles long.
Brodhead, Wis., vicinity of	27	3:30 p. m. C. S. T.			1,000	do	Loss principally in tobacco.
Hill City, Kans.	27	4:30 p. m.	1 15		3,000	Heavy hail	Loss in crops; path 30 miles long.
Le Flore County, Okla.	27				35,000	Wind	Property damaged.
Sequoyah County, Okla.	27			1	225,000	do	Property damaged; 1 person injured.
Harrison County, Iowa	27	2 a. m.	1 1		10,500	Hail and wind	Loss in crops from hail; \$10,000, wind damage to property, \$500; path 6 miles long.
Switzerland County, Ind.	28	4:20 p. m.	1 1			Hail	Loss in tobacco.
Oakley, Kans., vicinity of	28	6 p. m.	100	0		Tornado	Storm moved northwest over harvested wheat fields for about 4 miles.
Lane County, Kans., southern portion	28	p. m.	1 6		15,000	Heavy hail	Loss in sorghums; path 11 miles long.
Cedaredge, Colo.	29	1:30-2 p. m.	1 2		77,000	Hail	\$75,000 loss in fruit and \$2,000 in grain; path 2 miles long.
Cordell, Okla.	29	12:30 a. m.	1 1		60,000	do	Loss in crops and livestock; damage to buildings; path 14 miles long. Loss in crops, \$50,000; property damage, \$10,000.
Golden Valley County, Mont.	30	6 p. m.			7,000	Moderate hail	Loss in wheat and oats.
Fergus County, Mont.	30	6:30 p. m.	1 6		75,000	Heavy hail and wind	Loss in wheat, barley, and oats; loss from hail \$7,000; from wind, \$5,000; path 30 miles long.
Golden Valley and Yellowstone Counties, Mont.	30	8 p. m.	1 6		401,250	Heavy hail	Loss in all cereal crops and hay. Most destructive storm in 35 years. Crop loss, \$400,000; property damage, \$1,250; path 30 to 40 miles long.
Cloud Chief, Okla.	30	10 p. m.	1 2		120,000	Hail	Loss in cotton, corn, and livestock; buildings damaged; path 40 miles long.
Fallon County, Mont.	30	p. m.			50,000	Heavy hail	Loss in crops.
Plainville, Kans., and vicinity	31	6-7 a. m.	1 6		170,000	do	Chief damage in corn and gardens; path 23 miles long.
Ellis and Rooks Counties, Kans.	31	6:30 a. m.	1 8		50,000	do	Chief loss in crops; path 20 miles long.
Chouteau County, Mont.	31	9:30 a. m.	2 640		35,000	Moderate to heavy hail	Loss in wheat, barley and oats.
Gallatin County, Mont.	31	5:30 p. m.	1 6		150,000	Moderate hail	Loss in alfalfa, peas and grain; path 18 miles long.
Fergus County, Mont.	31	4:30 p. m.	1 5		25,000	Moderate to heavy hail	Loss in wheat and barley; path 10 miles long.
Blaine County, Mont.	1	7 p. m.	1 2		12,000	Moderate hail	Loss in wheat and barley; path 4 miles long.

1 Miles instead of yards.

SOLAR RADIATION AND SUNSPOT DATA FOR JULY 1944

[Solar Radiation Investigations Section, I. F. Hand, in charge]

SOLAR RADIATION OBSERVATIONS

EXPLANATIONS of the tables and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the January 1944 REVIEW, page 43. A list of the pyrheliometric stations also is given on page 45 of the same REVIEW.

TABLE 1.—Solar radiation intensities during July 1944

[Gram-calories per minute per square centimeter of normal surface]

MADISON, WIS.

Date	Sun's zenith distance										Local mean solar time
	7:30 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	1:30 p. m.
	75th mer. time	Air mass									
		A. M.					P. M.				
	e	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e
July 1.....	mb.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	mb.
July 1.....	12.7	0.75	0.83	0.96	1.16	1.34	1.26	1.04	0.84	0.63	13.2
July 3.....	14.8	.45	.54	.62	.83	1.26	1.04	0.84	0.63	0.76	10.2
July 4.....	15.3	.....	.....	.42	.62	.78	.....	.....	.....	1.13	9.8
July 6.....	18.3	.....	.39	.55	.75	1.03	.....	.....	.....	1.21	9.3
July 10.....	16.5	.65	.74	.83	.90	.....	.....	.....	.....	1.24	8.8
July 13.....	16.9	.57	.61	.70	.91	1.20	.....	.....	.....	1.15	8.5
July 14.....	16.5	.61	.73	.86	1.03	.....	.....	.....	.....	1.20	11.4
July 19.....	17.7	.66	.76	.92	1.16	1.31	.....	.....	.....	1.41	8.5
July 21.....	11.8	.71	.81	.94	1.11	1.37	.....	.....	.....	1.15	13.6
July 22.....	13.2	.61	.70	.91	1.06	1.31	.....	.....	.....	1.21	11.8
July 24.....	19.6	.60	.76	.88	1.01	1.09	.....	.....	.....	1.25	14.2
July 25.....	15.3	.64	.70	.86	.99	1.30	.....	.....	.....	1.36	14.2
July 27.....	16.5	.74	.83	.95	1.10	1.33	.....	.....	.....	1.21	16.5
July 28.....	13.2	.75	.83	.94	1.11	1.40	.....	.....	.....	1.27	14.2
July 31.....	15.3	.65	.76	.87	.98	1.33	.....	.....	.....	1.08	16.7
Means.....	.65	.71	.82	.98	1.23	.....	.....	.....	.....	1.02	.....
Departures.....	+.01	-.04	-.06	-.07	-.06	.....	.....	.....	.....	+.01	.....

LINCOLN, NEBR.

Date	Sun's zenith distance										Local mean solar time
	7:30 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	1:30 p. m.
July 2.....	21.8	.....	.....	.....	1.19	0.92	0.73	0.58	0.47	.....	23.4
July 5.....	15.3	.....	.....	.....	1.09	.90	.75	.62	.50	.....	17.7
July 7.....	20.4	.....	.....	.....	1.27	.....	.....	.....	.....	.....	19.0
July 13.....	16.4	.....	.....	.....	1.30	1.06	.88	.75	.60	.....	15.8
July 14.....	17.7	.....	.....	.....	1.30	1.01	.....	.....	.....	.....	20.4
July 17.....	19.6	.....	.....	.....	1.30	1.10	.....	.....	.....	.....	25.9
July 18.....	21.1	.....	.....	.....	1.33	.....	.....	.....	.....	.....	19.6
July 20.....	16.4	.....	.....	.....	1.42	1.23	1.10	.97	.88	.....	12.7
July 21.....	12.3	.....	.....	.....	1.42	1.19	1.03	.90	.82	.....	9.1
July 26.....	19.6	.....	.....	.....	1.31	.....	.....	.....	.....	.....	20.4
July 28.....	14.2	.....	.....	.....	1.35	1.17	.97	.....	.....	.....	12.7
July 29.....	19.6	.....	.....	.....	1.21	1.36	.....	.....	.....	.....	17.7
Means.....	.....	.....	.....	.....	(1.21)	1.30	1.07	.91	.76	.67	.....
Departures.....	.....	.....	.....	.....	+.12	-.03	.09	+.02	.00	-.01	.....

*Extrapolated.

TABLE 1.—Solar radiation intensities during July 1944—Continued

[Gram-calories per minute per square centimeter of normal surface]

ALBUQUERQUE, N. MEX.

Date	Sun's zenith distance										Local mean solar time
	7:30 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	1:30 p. m.
	75th mer. time	Air mass									
		A. M.					P. M.				
	e	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e
July 1.....	mb.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	mb.
July 1.....	9.5	0.56	0.63	0.76	0.94	1.48	.....	.....	.....	.....	9.1
July 7.....	8.5	.84	.88	1.04	.....	.....	.....	.....	.....	.....	10.2
July 10.....	11.8	.....	.....	.....	1.14	1.13	1.21	1.04	1.01	.90	9.8
July 11.....	6.3	.....	.....	.....	1.07	1.38	1.31	1.24	1.18	1.16	6.3
July 12.....	8.8	.....	.....	.....	1.10	1.44	1.29	1.15	1.04	.99	9.5
July 13.....	11.4	.....	.....	.....	.....	.....	1.40	1.20	.....	.....	8.8
July 16.....	11.0	.....	.....	.....	.....	1.41	.....	.....	.....	.....	11.4
July 17.....	11.0	.....	.....	.....	.....	.....	1.15	.....	.....	.....	8.5
July 21.....	11.4	1.08	1.12	1.17	1.26	.....	1.45	1.08	.99	.....	13.6
July 22.....	12.2	.....	.....	1.09	1.21	1.45	1.25	1.20	1.14	.....	11.8
July 25.....	10.6	.....	.....	.....	1.21	1.45	1.36	.....	.....	.....	8.5
July 26.....	11.4	.....	.....	.....	1.25	1.44	1.29	1.21	1.17	1.14	6.0
July 27.....	6.3	.....	.....	1.27	1.44	.....	.....	.....	.....	.....	6.3
July 28.....	8.4	.90	1.02	1.14	.....	.....	1.08	1.40	1.24	.....	9.1
July 29.....	10.2	.....	.....	.....	1.08	1.40	1.24	1.14	1.08	1.02	7.9
July 30.....	9.1	.....	.....	.96	1.10	1.42	1.25	1.14	.....	.....	.....
Means.....	.84	.91	1.03	1.15	1.42	1.24	1.14	1.10	.84	.....	.....
Departures.....	+.05	+.04	+.04	.00	+.02	+.03	+.07	+.04	+.01	.....	.....

BLUE HILL, MASS.

Date	Sun's zenith distance										Local mean solar time
	7:30 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	1:30 p. m.
July 1.....	14.7	0.87	0.96	1.08	1.23	.....	1.11	0.96	0.84	0.73	12.3
July 2.....	13.2	.....	.80	.94	1.13	1.46	1.43	1.11	.99	.89	10.2
July 3.....	15.3	.....	.....	.....	1.13	1.46	1.43	1.11	.92	.80	14.2
July 4.....	16.4	.72	.84	.97	1.11	.....	.....	.....	.....	.....	15.9
July 5.....	16.4	.69	.80	.90	1.04	1.33	.76	.40	.....	.....	16.4
July 6.....	21.1	.39	.51	.60	.79	.....	.....	.....	.....	.....	20.3
July 7.....	19.6	.67	.78	.90	1.10	.....	.....	.....	.....	.....	18.3
July 8.....	21.8	.....	.32	.42	.61	.....	.80	.32	.19	.....	24.2
July 9.....	21.8	.08	.11	.17	.32	.....	.38	.28	.21	.15	23.4
July 10.....	21.8	.35	.....	.52	.59	.....	.....	.....	.....	.....	21.1
July 14.....	14.2	.62	.....	.....	.....	.....	.83	.71	.....	.....	15.3
July 15.....	20.3	.47	.55	.....	.97	.....	.....	.....	.....	.....	18.3
July 17.....	15.9	.....	.....	.....	.....	.....	1.18	.98	.87	.74	15.9
July 18.....	13.2	.68	.79	.....	.....	.....	1.18	1.03	.90	.80	10.6
July 19.....	16.4	.....	.....	.....	.....	.....	1.03	.83	.69	.58	14.7
July 22.....	13.2	.82	.92	1.04	1.10	.....	.85	.71	.58	.....	15.9
July 23.....	17.0	.48	.64	.81	1.04	1.44	.....	.76	.61	.54	10.4
July 28.....	21.8	.....	.....	.57	.....	.....	.....	.....	.....	.....	20.3
July 31.....	18.3	.....	.....	.....	.....	.....	1.11	.88	.....	.63	15.9
Means.....	.57	.67	.74	.93	1.41	.96	.78	.68	.62	.....	.....
Departures.....	-.03	-.02	-.11	-.16	+.14	-.04	-.05	-.02	-.03	.....	.....

*Extrapolated.

TABLE 2.—Daily totals and weekly means of solar radiation (direct+diffuse) received on a horizontal surface
[Gram-calories per square centimeter]

Date	Washington, D. C.	Madison, Wis.	Lincoln, Nebr.	New York, N. Y.	Fresno, Calif.	Fairbanks, Alaska	Columbia, Mo.	Boston, Mass.	Nashville, Tenn.	La Jolla, Calif.	Riverside, Calif.	Blue Hill, Mass.	Ithaca, N. Y.	Newport, R. I.	State College, Pa.	Put-in-Bay, Ohio	East Wareham, Mass.	Davis, Calif.	Boulder, Colo.
1944	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.
July 2	546	647	713	662	742	562	530	765	687	604	694	708	685	740	593	711	727	788	387
July 3	659	683	564	653	730	428	691	403	375	622	674	467	664	457	652	668	482	797	423
July 4	606	598	554	431	750	520	676	478	319	550	649	573	616	610	653	699	531	802	486
July 5	636	605	607	644	746	615	684	611	315	603	703	704	655	628	699	648	695	799	610
July 6	626	665	459	648	723	647	710	627	322	660	672	631	612	621	698	636	655	776	743
July 7	512	443	713	492	682	679	448	496	506	488	664	571	603	687	577	520	542	807	574
July 8	556	335	512	466	749	500	552	563	575	624	507	619	341	510	532	574	625	799	396
Mean	592	568	589	571	732	564	613	568	443	593	652	619	596	608	629	636	608	795	517
Departure	+82	+22	+1	+63	+32	+86			-52	+21	+46	+66	+27	+51	+109	+56	+101	+16	
July 9	540	636	641	596	767		422	507	408	554	536	535	614	554	628	268	809	771	478
July 10	552	544	495	521	706	634	413	512	633	594	537	551	380	618	625	603	615	769	314
July 11	612	424	306	490	729	679	313	404	550	596	493	444	388	564	669	508	541	759	572
July 12	579	472	727	539	710	604	679	562	554	585	615	556	338	361	481	329	324	750	549
July 13	147	667	722	370	685	395	683	519	584	596	567	502	605	375	624	580	374	754	583
July 14	242	621	689	590	675	495	710	676	613	673	596	715	707	625	617	663	628	739	585
July 15	426	684	590	586	700	585	559	495	577	586	518	555	460	562	546	626	568	670	373
Mean	442	578	596	528	719	552	540	525	560	598	559	531	499	523	599	511	508	744	494
Departure	-60	+39	+8	+34	+22	+63			+68	-12	-28	+36	-31	-3	+58	-41	+8	-14	
July 16	491	720	323	276	703	442	618	447	662	565	612	476	527	333	424	715	444	736	613
July 17	568	166	708	708	716	344	569	638	807	446	630	649	718	583	730	652	682	688	682
July 18	460	535	686	555	716	664	431	538	619	725	676	712	652	559	501	272	719	767	441
July 19	494	638	597	576	725	170	656	535	554	672	670	633	153	634	195	515	673	782	352
July 20	262	553	753	426	711	271	654	371	132	397	673	417	141	485	183	475	459	767	356
July 21	508	705	733	472	709	490	734	282	747	557	658	345	321	279	614	725	280	764	587
July 22	672	695	698	686	715	428	716	638	722	510	667	667	602	671	612	675	693	756	619
Mean	494	573	642	529	713	401	626	493	563	554	655	557	445	506	466	576	564	752	521
Departure	+6	+39	+66	+53	+32	-31			+58	-17	+79	+56	-92	+6	-66	+36	+80	+16	
July 23	648	652	626	610	726	488	579	611	640	569	613	660	579	636	564	656	670	757	480
July 24	590	694	350	505	705	452	610	545	577	523	523	464	573	573	459	462	602	720	377
July 25	565	585	306	534	697	302	89	385	578	683	591	487	538	413	585	703	394	715	544
July 26	447	207	669	431	670	510	581	578	398	388	643	636	406	615	284	201	620	717	526
July 27	541	582	614	300	671	202	662	72	532	283	628	136	377	189	419	597	204	695	632
July 28	631	505	717	587	697	162	678	393	310	263	659	488	567	559	603	629	583	723	657
July 29	431	323	693	309	680	501	433	194	671	354	644	232	627	281	628	389	278	707	476
Mean	538	507	568	468	692	374	519	397	540	445	614	451	506	467	506	520	479	719	528
Departure	+48	-6	+18	+14	+34	-42			+73	-62	+79	-2	+26	-18	+6	-3	+11	0	
ACCUMULATED DEPARTURES ON JULY 29, 1944																			
	-2,514	-3,136	-8,824	-4,945	+3,222				+1,960	-3,257		+2,104		-2,311	+547	+139	+2,336	+963	

POSITIONS, AREAS, AND COUNTS OF SUNSPOTS FOR
JULY 1944

By LUCY T. DAY

[Equatorial Division, U. S. Naval Observatory]

[Communicated by Capt. J. F. Hellweg, U. S. N. (Ret.) Superintendent, U. S. Naval Observatory.] All measurements and spot counts were made at the Naval Observatory from plates taken at the observatories indicated. Difference in longitude is measured from the central meridian, positive toward the west. Latitude is positive toward the north. Areas are corrected for foreshortening and expressed in millionths of Sun's hemisphere. For each day, under longitude, latitude, area of spot or group, and spot count are included assumed longitude of center of the disk, assumed latitude of center of the disk, total area of spots and groups and total spot count.

Date	East- ern stand- ard time	Mount Wilson group No.	Heliographic				Area of spot or group	Spot count	Plate qual- ity	Observatory
			Dif- ference in longi- tude	Lon- gi- tude	Lat- itude	Dis- tance from cen- ter of disk				
1944 July 1	h m		°	°	°	°				
1	11 0		No spots						G	U. S. Naval.
2		7646	+23	93	+29	33	36	4	F	Mt. Wilson.
				70	(+3)		36	4		
3	10 51	7646	+37	96	+30	44	48	12	G	U. S. Naval.
				(59)	(+3)		48	12		
4	10 26	7646	+49	95	+30	53	12	1	G	Do.
				(46)	(+3)		12	1		
5	10 56	7646	+63	95	+30	64	12	1	F	Do.
				(32)	(+3)		12	1		
6	10 39	7646	+77	96	+29	77	12	1	G	Do.
				(19)	(+3)		12	1		
7	12 50		No spots							Mt. Wilson.
8	13 0		No spots							Do.
9	8 38	7647	-34	307	+2	34	16	1	G	Do.
				(341)	(+4)		16	1		
10	10 33	7648	-14	312	-7	18	48	7	G	U. S. Naval.
				(326)	(+4)		48	7		
11	8 47	7648	+1	315	-7	11	24	3	G	Mt. Wilson.
				(314)	(+4)		24	3		
12	10 37		No spots						G	U. S. Naval.
13	11 30		No spots							Mt. Wilson.
14	13 26		No spots						F	U. S. Naval.
15	11 10		No spots						G	Do.
16	12 10		No spots						F	Do.
17	10 49		No spots						G	Do.
18	11 18		No spots						G	Do.

POSITIONS, AREAS, AND COUNTS OF SUNSPOTS FOR
JULY 1944—Continued

Date	East- ern stand- ard time	Mount Wilson group No.	Heliographic				Area of spot or group	Spot count	Plate qual- ity	Observatory
			Dif- ference in longi- tude	Lon- gi- tude	Lat- itude	Dis- tance from cen- ter of disk				
1944 July 19	h m	m	°	°	°	°	°	°		
19	11 2	7649	-70	137	-30	75	6	1	F	U. S. Naval.
		7649	-66	141	-28	69	6	1		
				(207)	(+5)		12	2		
20	10 41	7649	-54	140	-28	62	12	3	F	Do.
				(194)	(+5)		12	3		
21	10 36		No spots						G	Do.
22	11 12	7650	-23	144	+6	24	12	3	F	Do.
				(167)	(+5)		12	3		
23	11 8	7650	-11	143	+6	12	24	2	G	Do.
				(154)	(+5)		24	2		
24	10 57	7651	-67	74	-29	70	6	1	G	Do.
				(141)	(+5)		6	1		
25	10 36	7652	-21	107	+17	24	24	7	G	Do.
				(128)	(+5)		24	7		
26	8 56	7652	-9	107	+18	17	24	3	G	Mt. Wilson.
				(116)	(+5)		24	3		
27	9 2	7653	+38	140	-29	49	36	4	VG	Do.
				(102)	(+5)		36	4		
28	10 24	7653	+47	135	-30	59	48	2	G	U. S. Naval.
		7652	+52	140	-28	62	97	1		
				(88)	(+6)		145	3		
29	10 29	7653	+59	134	-29	67	48	2	F	Do.
		7653	+64	139	-28	71	97	1		
				(75)	(+6)		145	3		
30	13 1	7653	+74	134	-28	78	97	1	F	Do.
		7653	+80	140	-29	88	145	1		
				(60)	(+6)		242	2		
31	10 53		No spots						F	Do.

Mean daily area for 31 days=29

VG=very good; G=good; F=fair; P=poor.
†Data taken from Mount Wilson charts.PROVISIONAL RELATIVE SUNSPOT NUMBERS FOR
APRIL 1944

[Based on observations at Zurich, except as otherwise noted. Data furnished through the courtesy of Prof. W. Brunner, Swiss Federal Observatory, Zurich Switzerland.]

Observations on all 30 days of April showed no sunspots.

Chart I. Departure (°F.) of the Mean Temperature from the Normal, and Wind Roses for Selected Stations, July 1944

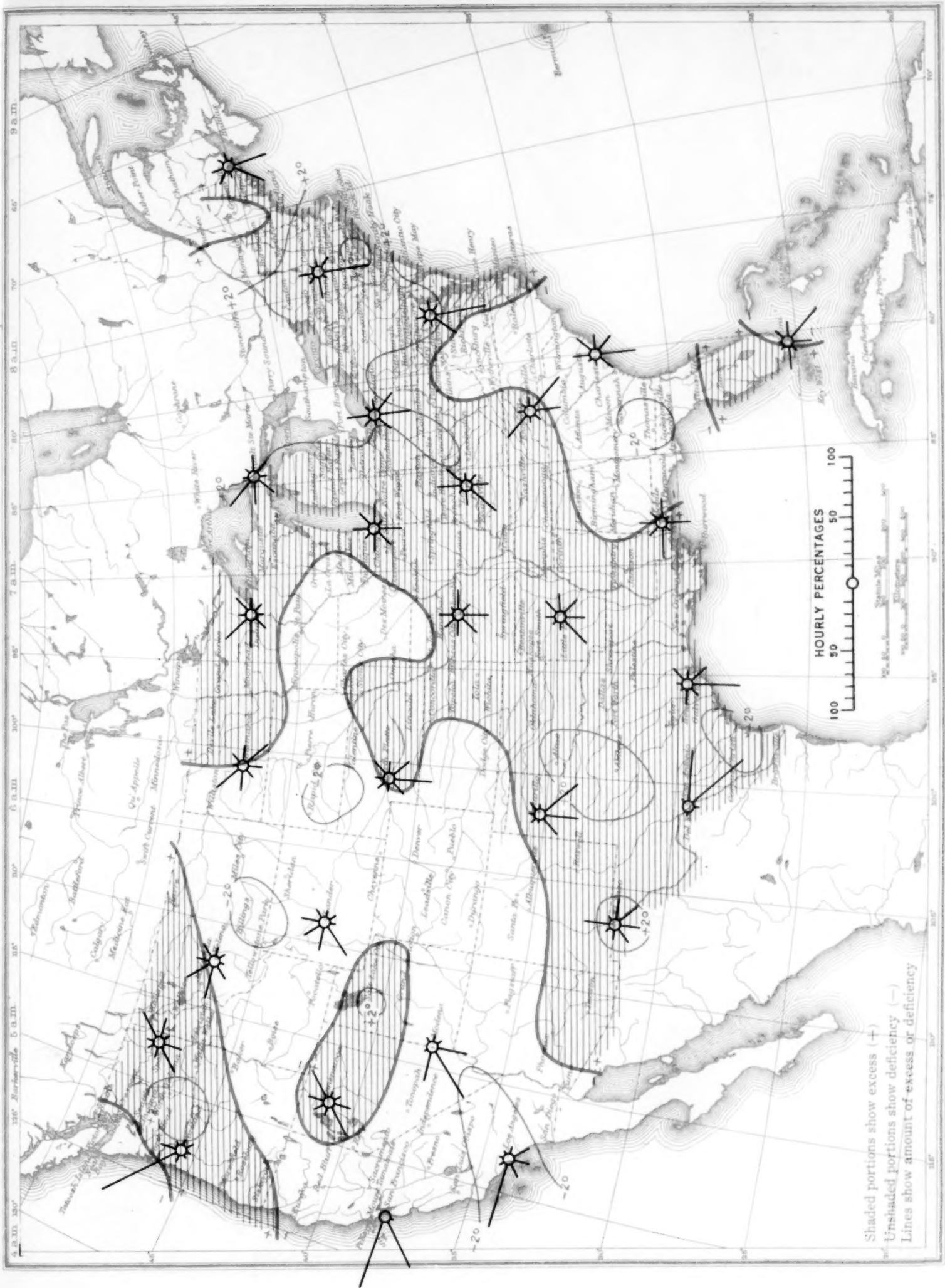
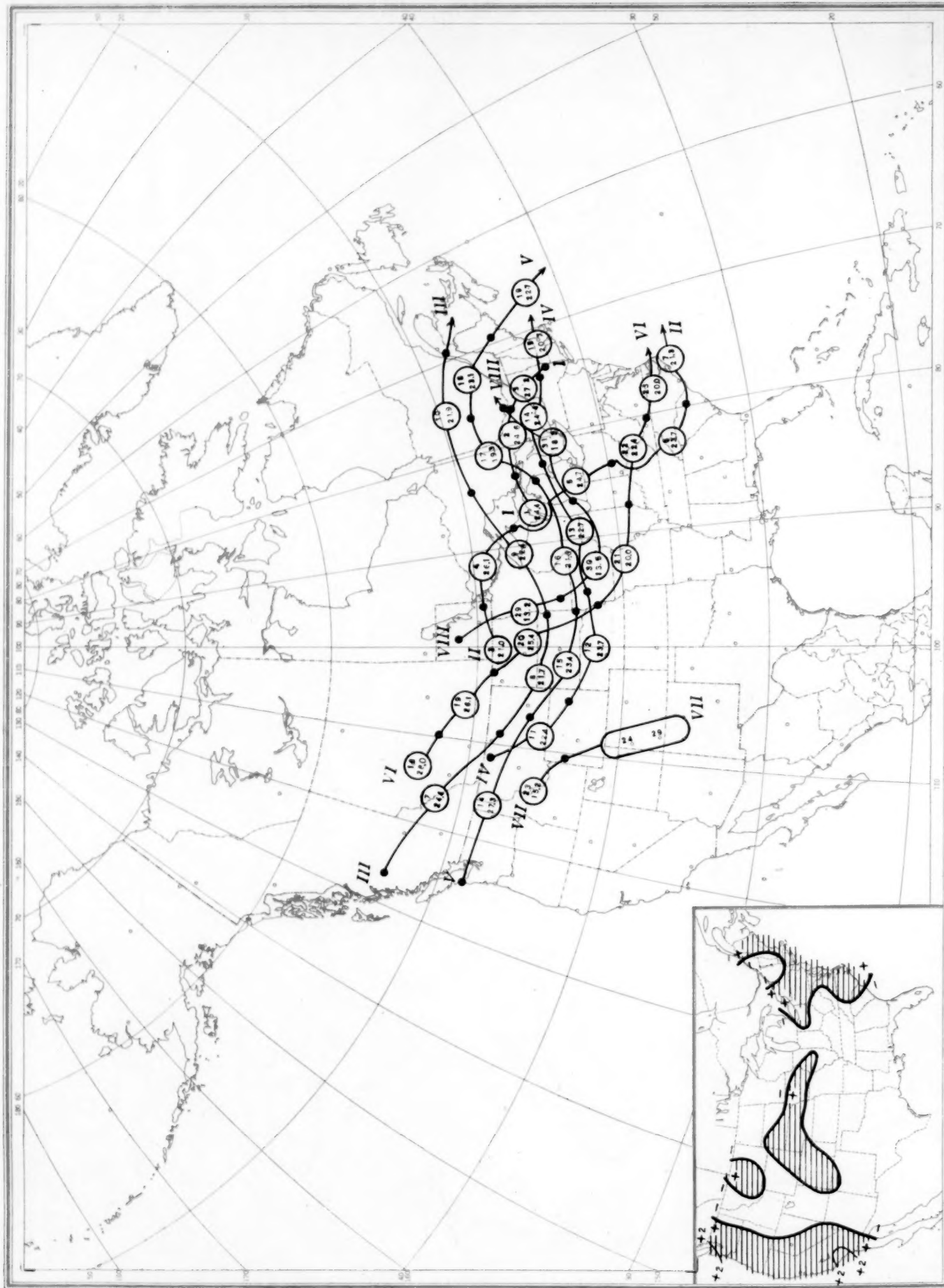


Chart II. Tracks of Centers of Anticyclones, July 1944. (Inset) Departure of Monthly Mean Pressure from Normal
(Plotted by A. Bloom)

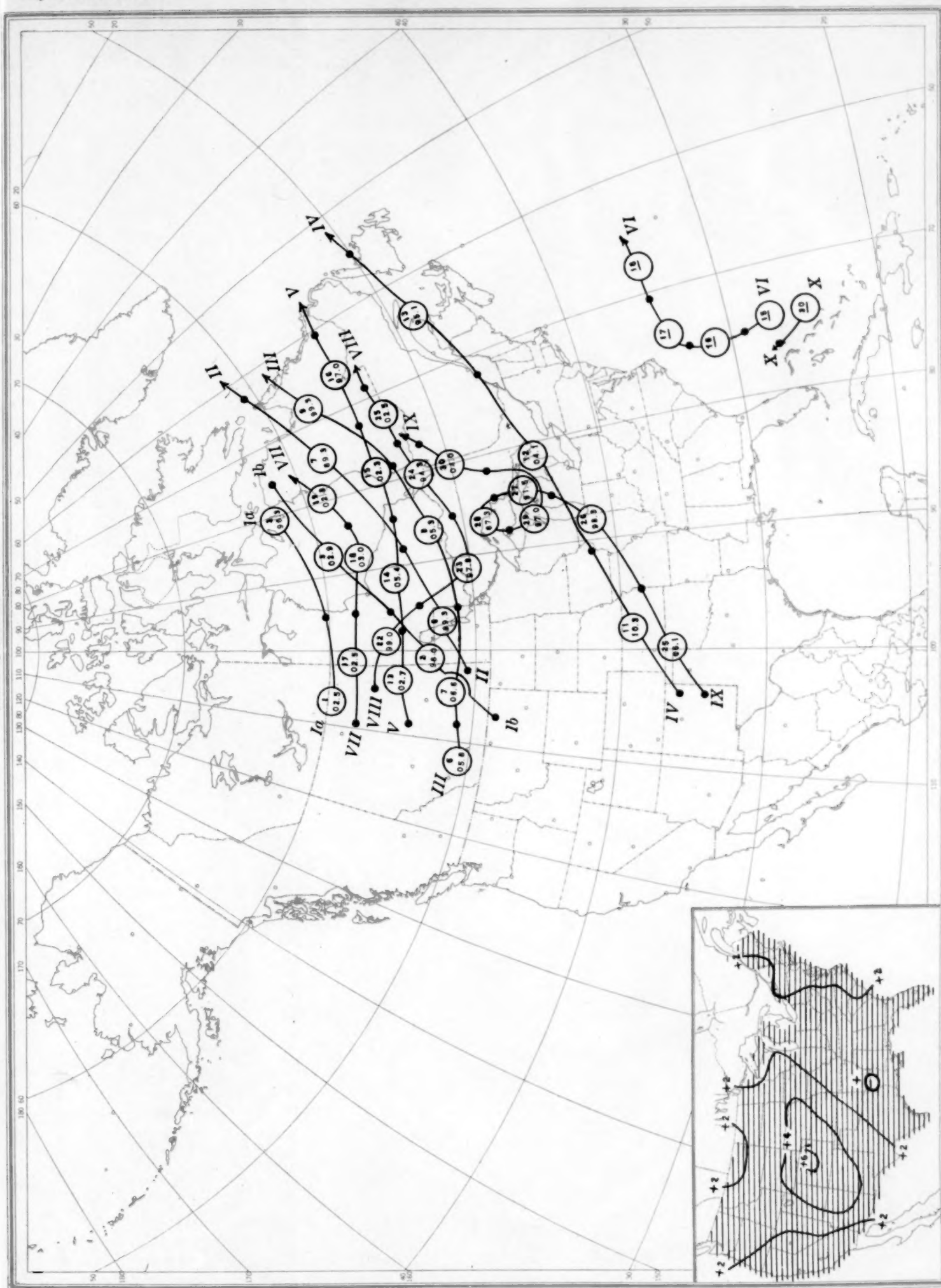


Circle indicates position of anticyclone at 7:30 a. m. (75th meridian time), with barometric reading. Dot indicates position of anticyclone at 7:30 p. m. (10th meridian time)

Chart III. Tracks of Centers of Cyclones, July 1944. (Inset) Change in Mean Pressure from Preceding Month

Chart III. Tracks of Centers of Cyclones, July 1944. (Inset) Change in Mean Pressure from Preceding Month

(Plotted by A. Bloom)



Circle indicates position of cyclone at 7:30 a. m. (75th meridian time), with barometric reading. Dot indicates position of cyclone at 7:30 p. m. (75th meridian time).

Chart IV. Percentage of Clear Sky Between Sunrise and Sunset, July 1944

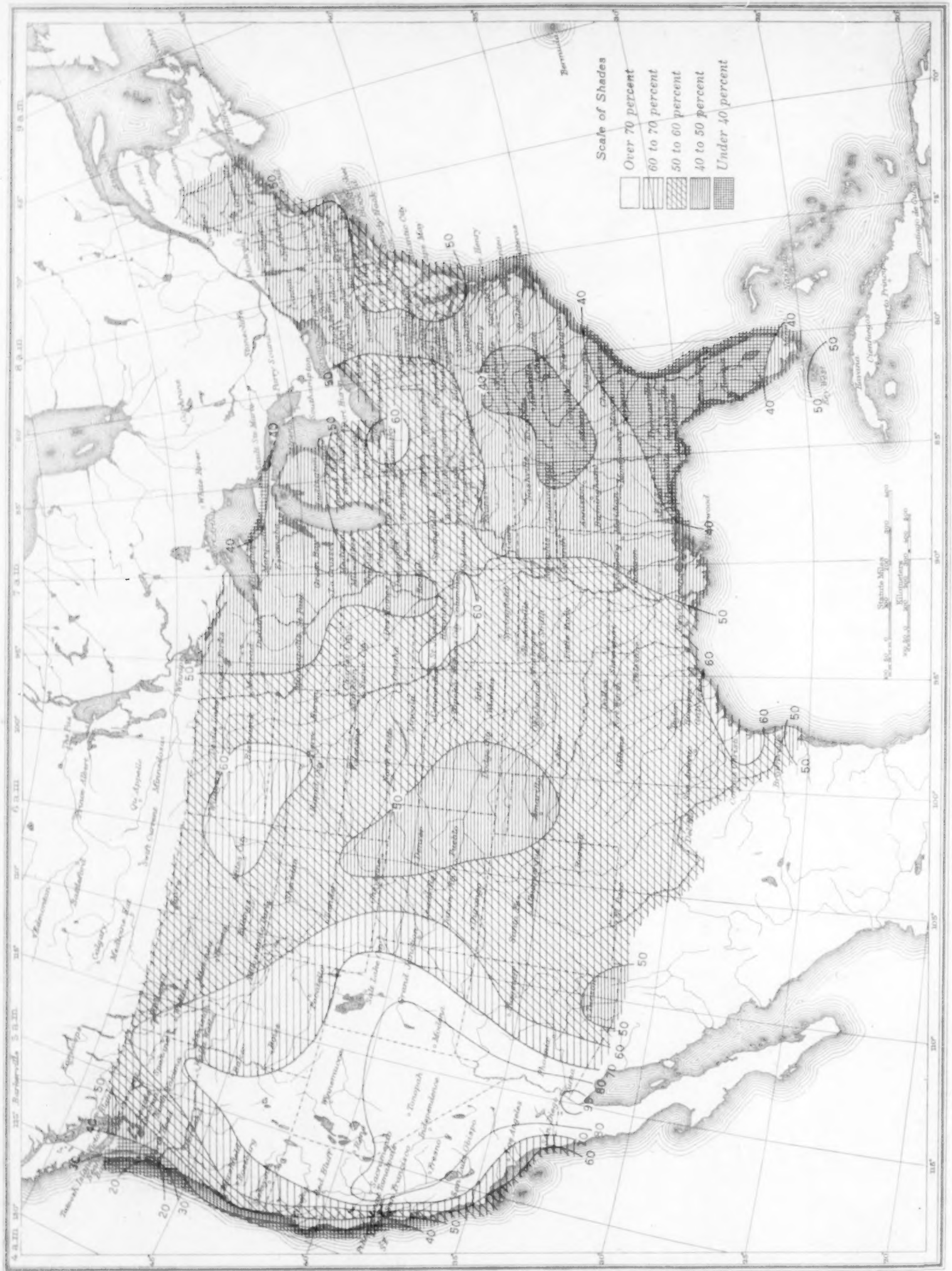


Chart V. Total Precipitation, Inches, July 1944. (Inset) Departure of Precipitation from Normal

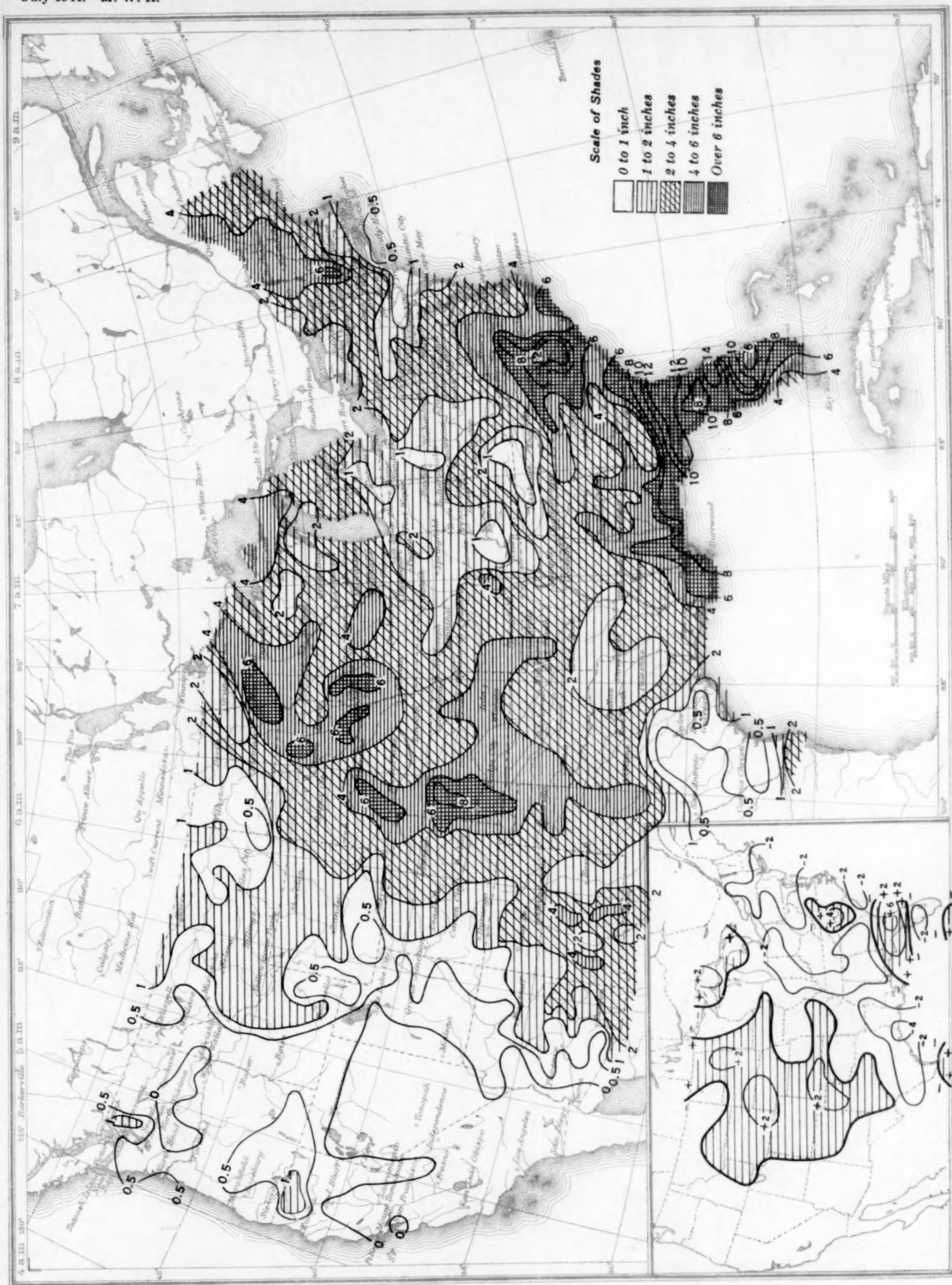


Chart VI. Isobars at Sea Level and Isotherms at Surface; Prevailing Winds, July 1944

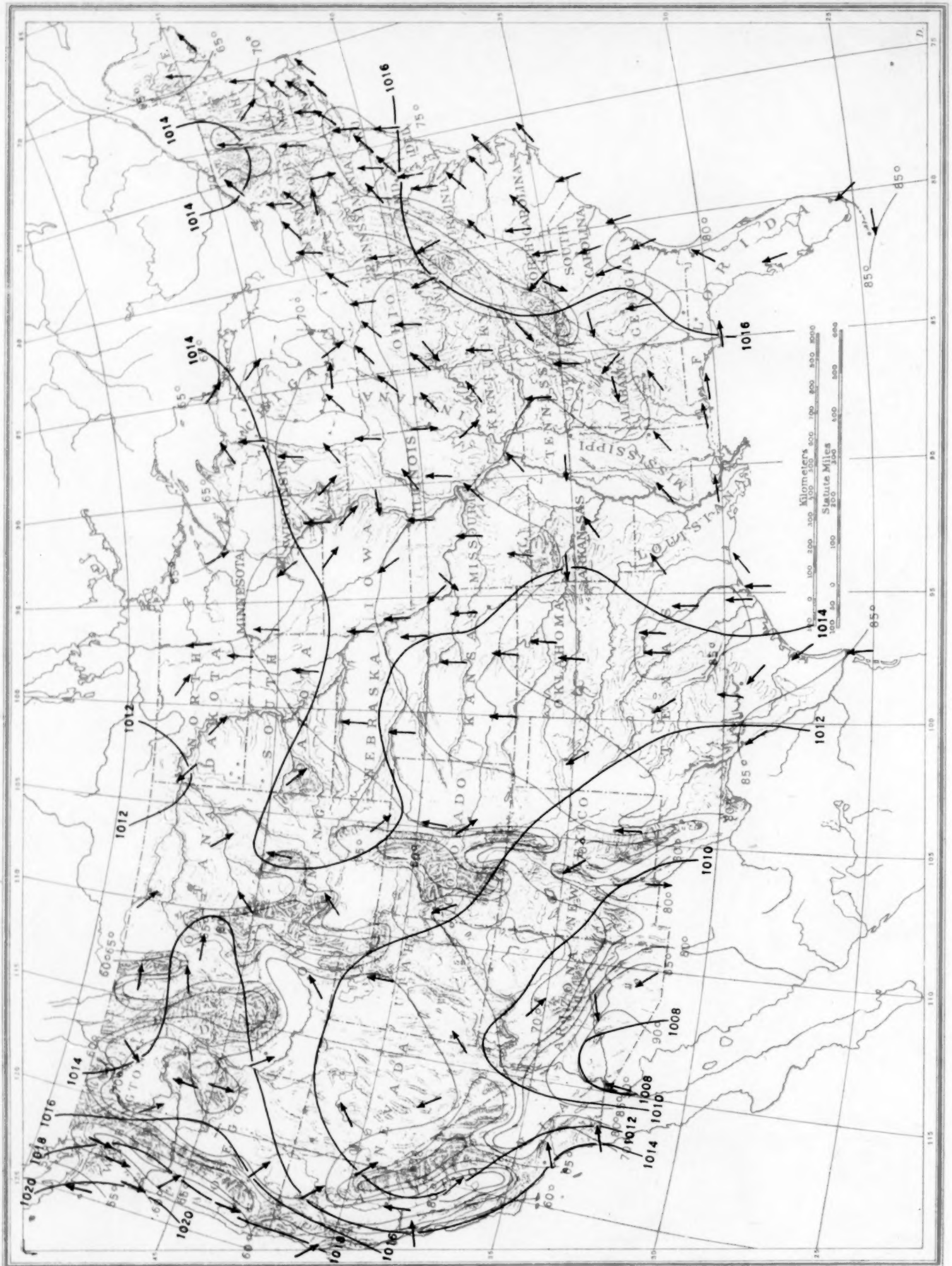


Chart VIII. Isobars (mb) for 1,524 Meters (5,000 ft.), and Isotherms (°C.), and Resultant Winds for 1,500 Meters (m.s.l.) July 1944
 Isotherms and Isotherms based on radiosonde observations at 11:00 p. m. (E. S. T.) and winds based on pilot-balloon observations at 5:00 a. m. (E. S. T.).

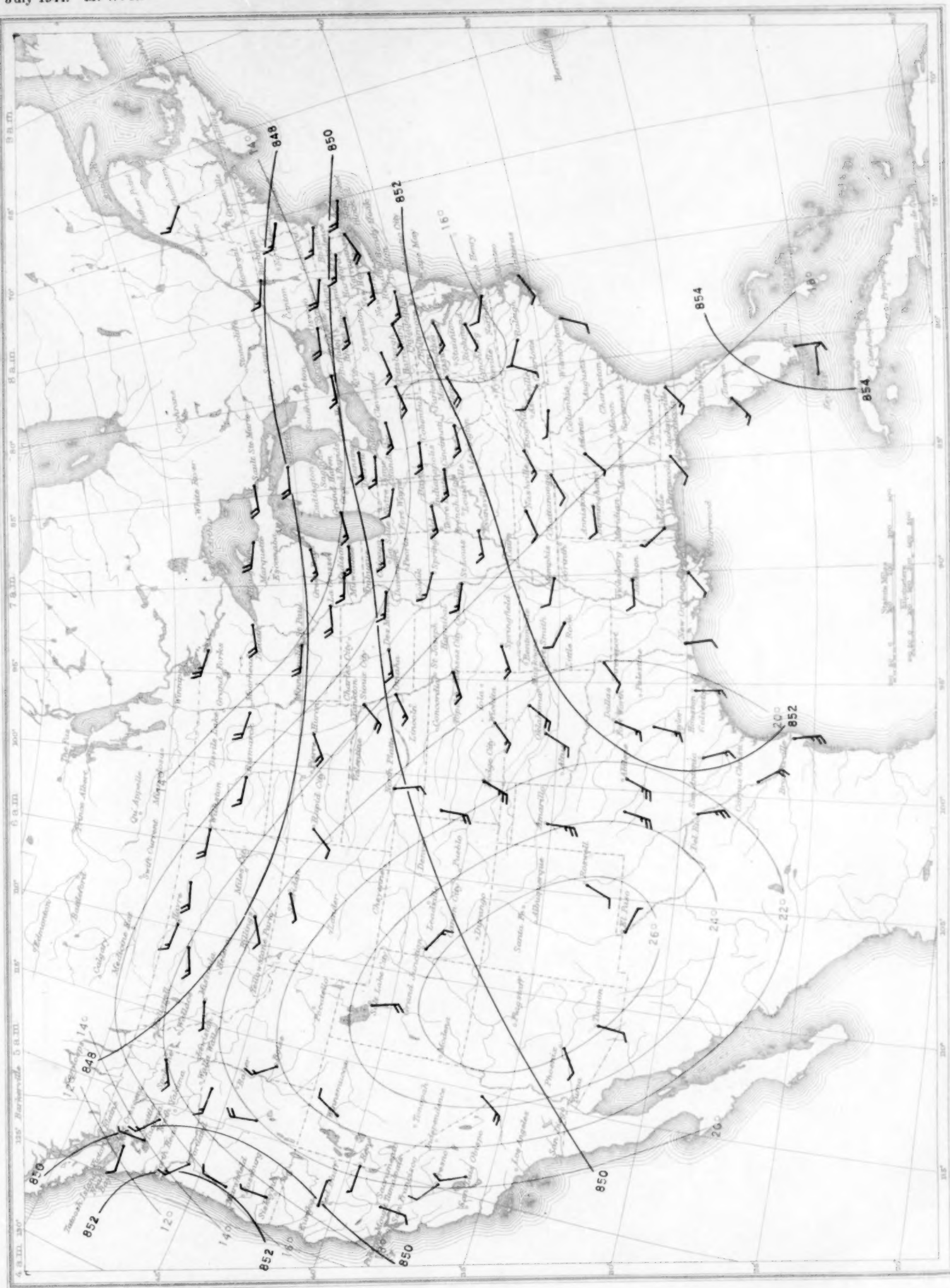


Chart IX. Isobars (mb), Isotherms ($^{\circ}\text{C}$), and Resultant Winds for 3,000 Meters (m. s. l.) July 1944
 Isolobars and Isotherms based on radiosonde observations at 11:00 p. m. (E. S. T.) and winds based on pilot-balloon observations at 5:00 a. m. (E. S. T.).

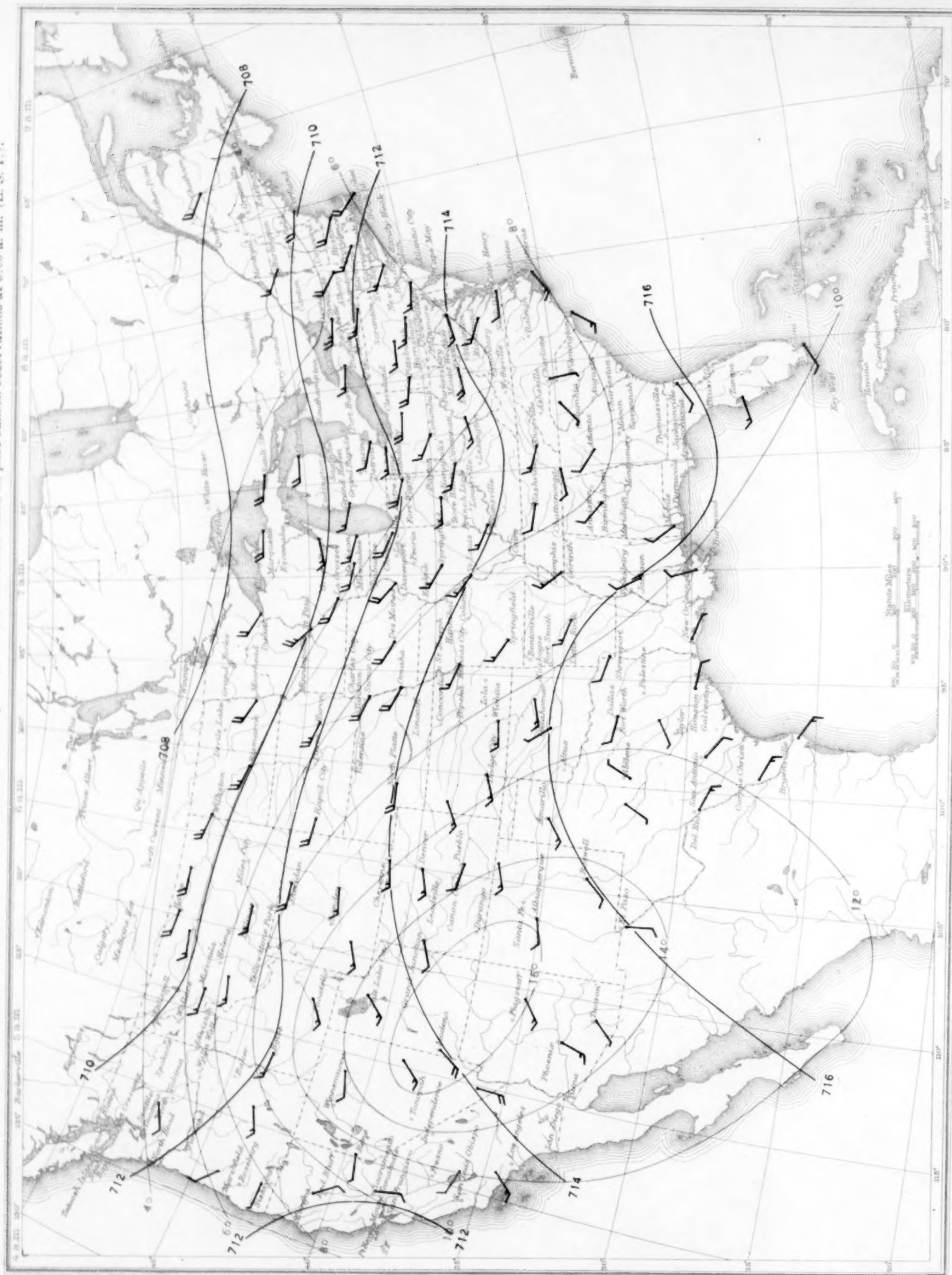


Chart X. Isobars (mb), Isotherms (°C.), and Resultant Winds for 5,000 Meters (m. s. l.) July 1944
Isobars and Isotherms based on radiosonde observations at 11:00 p. m. (E. S. T.) and winds based on pilot-balloon observations at 5:00 p. m. (E. S. T.).

